Design For Recycling

GUIDELINES for packaging

CIRCPACK by VEOLIA

Version ENG V1/23 – 7th of February 2023

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

As **resources are limited**, it becomes more and more **important** to make these used materials **recyclable.** That's how we can give them a **circular life**.

Enabling recycling 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.

Give packaging a second life, **design for recycling!**

Design For Recycling

THE **4 ESSENTIAL STEPS** IN RECYCLING

Recyclability only truly exists when it is part of our day-to-day operations.

Before we consider a packaging to be ‘recyclable’, four **ESSENTIAL STEPS IN RECYCLING** have to be met:

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

GUIDELINES

On the following pages you will find a detailed description of materials that are wanted and unwanted in your packaging design.

These guidelines are based on years of experience and research on the effect of material-combinations on **1)** sorting, **2)** reprocessing and **3)** the properties of recycled material.

There are guidelines for a lot of **different materials**. Please check the material of which the **main component** of your packaging is made.

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GUIDELINES for packaging

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Material:

PET-bottles

Clear

- PET-trays
- PP rigids
- PP flexibles
- PE rigids
- PE flexibles
- PS
- Paper & cardboard
- Beverage cartons
- Glass
- Steel
- Aluminium

		Class A-B Full compatibility for reprocessing	Class B-C Limited compatibility for reprocessing	Non-recyclable Low (or no) compatibility for reprocessing
Main body	Main Material Bottle*	PET		PLA; PVC; PS; PETG
	Material composition	A when PET content is > 95%; B when PET content is > 90% and all packaging features are FULLY compatible with recycling	C when PET content is > 70% and all packaging features are FULLY compatible with recycling	D when PET content is > 50%; E when PET content is> 30%; F when PET content is < 30%
	Colours	Transparent clear, transparent light blue		Other transparent colours; Opaque; Fluorescence; Metallic
	Size			< 4 cm (compacted); > 5 liter content
	Product residues Easy to empty index	A if the index is < 5%; B if the index is < 10%	C if the index is < 15%	D if the index is < 20%; E < if the index is 25%; F if the index is > 25%
	Barrier	SiOx plasma coating	Carbon plasma-coating; PA-MXD6 multilayer with <5wt% PA-MXD6 and no tie layers; PGA multilayer; PTN alloy	PA-MXD6 multilayer with >5wt% PA-MXD6 or with tie layers; Monolayer PA-MXD6 blend; EVOH
	Additives		UV stablilisers; Acetaldehyde (AA) blockers; Optical brighteners; Oxygen scavengers	Bio-/oxo-/photodegradable additives; Nanocomposites
Attachments	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; foamed PET (all with a density < 1 g/cm³)	Silicone with density <0.95g/cm³; Floatable TPE	Materials with density >1 g/cm³ (e.g. PVC, silicone, metals)
Decoration	Labels	Labels in PE; PP; OPP; EPS; foamed PET (all with density <1 g/cm³), with a size that does not hinder* the recognition of the underlaying PET-polymer ** indication label size of bottles > 500 ml: < 70% coverage* ** indication label size of bottles ≤ 500 ml: < 50% coverage*	Lightly metallized labels; Paper labels without fiberlosses	Labels which hinder the recognition of the underlaying PET-polymer (e.g. too large, metalised, heavily inked); Labels with density >1 g/cm³ (e.g.PVC; PS; PET; PETG; PLA); Metallized labels; Non-detaching 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; EPS; foamed PET; LDPET (all with density <1 g/cm³), with a size that does not hinder* the recognition of the underlaying PET-polymer ** Indication sleevesize of bottles > 500 ml: < 70% coverage* ** Indication sleevesize of bottles ≤ 500 ml: < 50% coverage*	Full sleeves translucent for IR detection in PE; PP; OPP; EPS; foamed PET; LDPET; all with density <1 g/cm³ *INTERIM: Twin-peforated sleeves for household and personal care conform guidelines by EPBP*	Sleeves which hinder the recognition of the underlaying PET-polymer (e.g. too large, metalised, 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; EPS, Foamed PET (all with density <1 g/cm³)		Materials with density >1 g/cm³ (e.g metal; PVC; PS; PET, PETG); Metallised materials
	Adhesives for labels	Alkali/water releasable adhesive at 60-80°C without reactivation	Hot-melts; Pressure-sensitive labels	Alkali/water soluble adhesive; Alkali/water non-soluble or non-releasable adhesive 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	Components which are separated by grinding and float/sink - all with density <1 g/cm³; Unpigmented PET		Materials with density >1 g/cm³ (e.g. metal, RFID tags); Non detaching or welded components; Coloured PET

Last update: September 2022

*Polymer resin can be either fossil- or bio-based, virgin or recycled.

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Material:

PET-bottles
Coloured
- PET-trays
- PP rigids
- PP flexibles
- PE rigids
- PE flexibles
- PS
- Paper & cardboard
- Beverage cartons
- Glass
- Steel
- Aluminium

		Class A-B Full compatibility for reprocessing	Class B-C Limited compatibility for reprocessing	Non-recyclable Low (or no) compatibility for reprocessing
Main body	Main Material Bottle*	PET		PLA; PVC; PS; PETG
	Material composition	A when PET content is > 95%; B when PET content is > 90% and all packaging features are FULLY compatible with recycling	C when PET content is > 70% and all packaging features are FULLY compatible with recycling	D when PET content is > 50%; E when PET content is> 30%; F when PET content is < 30%
	Colours	Transparent light colours	Transparent dark colours	Opaque; Fluorescence; Metallic
	Size			< 4 cm (compacted); > 5 liter content
	Product residues Easy to empty index	A if the index is < 5%; B if the index is < 10%	C if the index is < 15%	D if index is < 20%; E < if index is 25%; F if index is > 25%
	Barrier	SiOx coating; Carbon plasma-coating; PTN alloy; PA-MXD6 multilayer with <6wt% PA-MXD6 and no tie layers;	EVOH multilayer with <3 wt% EVOH and no tie layers; PA-MXD6 multilayer with <6wt% PA-MXD6 including tie layers; Monolayer PA-MXD6 blend; PGA multilayer	EVOH multilayer with >3wt% EVOH or with tie layers. PA-MXD6 multilayer with >6wt% PA-MXD6
	Additives		UV stablilisers; Acetaldehyde (AA) blockers; Optical brighteners; Oxygen scavengers	Bio-/oxo-/photodegradable additives; Nanocomposites
Attachments	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; foamed PET (all with a density < 1 g/cm³)	Silicone with density <0.95g/cm³; Floatable TPE	Materials with density >1 g/cm³ (e.g. PVC, silicone, metals)
	Other Components	Base cup, handles or other components which are separated by grinding and float/sink - all with density <1 g/cm³; PET		Materials with density >1 g/cm³ (e.g. metal, RFID tags); Non-detaching or welded components
Decoration	Inks	Non-toxic (according to EUPIA guidelines)		Inks that bleed; Toxic or hazardous inks
	Labels	Labels in PE; PP; OPP; EPS; foamed PET (all with density <1 g/cm³), 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*	Lightly metallized labels; Paper labels without fiberlosses	Labels which hinder the recognition of the underlaying PET-polymer (e.g. too large, metalised, heavily inked); Labels with density >1 g/cm³ (e.g.PVC; PS; PET; PETG; PLA); Metallized labels; Non-detaching or welded labels; Paper labels with fibreloss; Foamed PETG labels (even with density <1 g/cm³); PET labels with washable inks
	Adhesives for labels	Alkali/water releasable adhesive at 60-80°C without reactivation	Hot-melts; Pressure-sensitive labels	Alkali/water soluble adhesive; Alkali/water non-soluble or non-releasable adhesive at 60-80°C
	Sleeves	Sleeves in PE; PP; OPP; EPS; foamed PET; LDPET (all with density <1 g/cm³), with a size that does not hinder* the recognition of the underlaying PET-polymer ** Indication sleevesize of bottles > 500 ml: < 70% coverage* ** Indication sleevesize of bottles ≤ 500 ml: < 50% coverage*	Full sleeves translucent for IR detection in PE; PP; OPP; EPS; foamed PET; LDPET; all with density <1 g/cm³ INTERIM: Twin-peforated sleeves for household personal care conform guidelines by EPBP	Sleeves which hinder the recognition of the underlaying PET-polymer (e.g. too large, metalised, 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; EPS, Foamed PET (all with density <1 g/cm³)		Materials with density >1 g/cm³ (e.g metal; PVC; PS; PETG); Metallised materials; Foamed PETG (even with density <1 g/cm³); PET with washable inks
	Direct Printing	Laser marked print	Printed production or expiry date	Any other direct printing

Last update: September 2022

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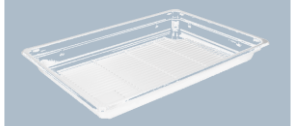
Material:

- PET-bottles
- PET-trays
  Clear
- PP rigids
- PP flexibles
- PE rigids
- PE flexibles
- PS
- Paper & cardboard
- Beverage cartons
- Glass
- Steel
- Aluminium



		Class A-B Full compatibility for reprocessing	Class B-C Limited compatibility for reprocessing	Non-recyclable Low (or no) compatibility for reprocessing
Main body	Tray*	PET		Any PET based multilayer material including PET/PE; PLA; PVC; PS; PETG; C-PET; PET-GAG; Expanded PET
	Material composition	A when PET content is > 95%; B when PET content is > 90% and all packaging features are FULLY compatible with recycling	C when PET content is > 70% and all packaging features are FULLY compatible with recycling	D when PET content is > 50%; E when PET content is> 30%; F when PET content is < 30%
	Colours	Transparent clear; Transparent light blue		Opaque; Other transparent colours; Metallic; Opaque
	Size		Items compacted < 5 cm	Items compacted < than 2 cm
	Product residues Easy to empty index	A if the index is < 5%; B if the index is < 10%	C if the index is < 15%	D if index is < 20%; E < if index is 25%; F if index is > 25%
	Barrier	PET based oxygen scavenger without yellowing effect after EPBP oven test	PET based oxygen scavenger with limited 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 stablilisers; AA blockers; optical brighteners; antiblocking masterbatch (> 3%); anti-stat agents; antiblocking agents; anti-fogging agents (on coating area)	Bio/Oxo/Photodegradable additives; Nanocomposites
Attachemnts	Closure Systems: Lidding films	Unprinted PET; Floating plastics with density < 1 g/cm³ and easily removal from the tray and without glue residuals; Foamed PET based films where foamed structure is not getting destroyed @90°C; SiOx and AluOx plasma for barrier		Any other film
	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 g/cm³)	Paper & cardboard not loosing fibres	PVC / PS / EPS / PU / PA; PC/PMMA; Thermoset plastics; Metals; Paper & cardboard loosing fibres
Decoration	Inks	Non toxic following the EuPIA Guidlines		Inks that bleed; Toxic or hazardous inks
	Labels	Labels in PE; PP; OPP (all with density <1 g/cm³ and also in the more heavily printing area), with a size that does not hinder* the recognition of the underlaying PET-polymer ** Indication label size of trays: < 30% coverage*	BPA-free paper labels without fibreloss during recycling process	Plastic labels with density > 1 g/cm³ (also in more heavily printed and glued area); Paper labels with fibreloss during recycling process; Paper labels containing BPA; Non floating paper labels
	Adhesive for labels	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		Any other adhesive
	Direct Printing	Laser marked	Production or expiry date	Any other direct printing

*Polymer resin can be either fossil- or bio-based, virgin or recycled.

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**Decorative technologies must not hinder the recognition of the underlaying PP-polymer. Features as size, print, mass colouration and/or barrier might require to perform a Sorting Evaluation Protocol. Known misleading features are listed on the RecyClass Methodology and the following size indications can be considered to ensure the recognition of PP:

- Size of non-PP detectable surfaces on containers > 500 ml: < 70% coverage
- Size of non-PP detectable surfaces on containers < 500 ml: < 50% coverage

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Material:

- PET-bottles
- PET-trays
- **PP rigids** Natural & white
- PP flexibles
- PE rigids
- PE flexibles
- PS
- Paper & cardboard
- Beverage cartons
- Glass
- Steel
- Aluminium

		Class A-B Full compatibility for reprocessing	Class B-C Limited compatibility for reprocessing	Non-recyclable Low (or no) compatibility for reprocessing
Main body	Main Material*	PP	PE ≤ 10%	Multilayers with PLA; PVC; PS; PET; PETG; PE > 10%
	Material composition	A when PP content is > 95%; B when PP content is > 90% and all packaging features are FULLY compatible with recycling	C when PP content is > 70% and all packaging features are FULLY compatible with recycling	D when PP content is > 50%; E when PP content is > 30%; F when PP content is <30%
	Colours	Natural (clear); White	Light colours	Black Inner layer; Black; Carbon Black; Other dark colours
	Size		Items compacted ≤ 5 cm	Items compacted < than 2 cm;
	Product residues Easy to empty index	A if the index is < 5%; B if the index is < 10%	C if the index is < 15%	D if the index is < 20%; E < if the index is 25%; F if the index is > 25%
	Barrier	EVOH ≤ 6% + PP-g -MAH tie layers with MAH ≥ 0.1wt% and EVOH:tie layers ratio ≤ 2;	EVOH > 6% + PP-g -MAH tie layers with MAH ≥ 0.1wt% and EVOH:tie layers ratio ≤ 2;	EVOH with different tie layers; PA; PVDC; Aluminium
	Additives	Additives that are unavoidable in processing (stabilizers, antioxidants, lubricants, nucleating agents, peroxides) and density remains <0.97 g/cm³	Mineral fillers ($CaCO_3$, talc) not increasing density more than 0,97 g/cm³	Additives changing the material density > 1 g/cm³; Flame-retardant additives, plasticizers Bio-/oxo-/photodegradable additive
Attachments	Closure Systems	PP	HDPE; LDPE; LLDPE; MDPE; PET; PETG; PS; PLA (all with a density >1g/cm3), Removable aluminium lidding	Non-PO and/or foams with density < 1 g/cm³; Aluminium; Metal; PVC
	Liners, Seals and Valves	PP; TPO ≤ 1%; TPS ≤ 1%	HDPE; LDPE; LLDPE; MDPE; TPE-PE; PET, PETG, PS, PLA (all with a density >1g/cm3); Removable silicon with a density > 1 g/cm³; PO foamed ≤ 1%	Non-PO and/or foams with density < 1 g/cm³; Any other TPE Aluminium; Metal; Foiled paper; PVC
	Other Components	PP	PE with density <1 g/cm³; PET; PETG; PS; PLA all with density >1 g/cm³; Electroplating on attachments (with density >1 g/cm³)	Aluminium; PVC; Glass components; Non-PO and /or foams with density < 1 g/cm³; Electroplating on attachments (with density <1 g/cm³)
	Colours	Natural (Clear); White	Light colours	Black inner layer; Black; Carbon Black; Other dark colours
Decoration**	Inks	Non-bleeding inks compliant with EuPIA Exclusion Policy		Inks that bleed; Toxic or hazardous inks
	Sleeves	Sleeves in PO (all with density < 1 g/cm³), Self-separable plastic and carboard sleeves under mechanical stress (sorting test mandatory)	Sleeves in PE (with density < 1 g/cm³); Sleeves in PET, PETG, PET-C, PLA, PS (all with density > 1 g/cm³), Cardboard sleeves without fiberloss (sorting test mandatory)	Sleeves that hinder the recognition of the PP; Sleeves in non PO-materials with density < 1 g/cm³; Aluminium; Metalised Sleeves;Heavily inked sleeves; PVC
	Labels	Labels in PP (all with density <1 g/cm³)*	Labels in PE, PO (with density <1 g/cm³); Labels in PET, PETG, PS, PLA (all with density >1 g/cm³); Labels in Paper without fibreloss; PO-foamed labels	Labels that hinder the recognition of the PP; Labels in non PO-materials with density < 1 g/cm³ ; Paper labels with fibreloss during recycling process Aluminium; Metallised labels; In-Mould-Labels; PVC
	Adhesives for labels	Water soluble or water releasable adhesive (@ less than 40°C)	Pressure sensitive labels	Non water soluble or water releasable adhesives
	Direct Printing	Laser marked; Production or best-before date		Any other direct printing
	Other Decorative Technolgies		Electroplating on attachments (with density > 1 g/cm³)	Electroplating on attachments (with density <1 g/cm³)

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**Decorative technologies must not hinder the recognition of the underlaying PP-polymer. Features as size, print, mass colouration and/or barrier might require to perform a Sorting Evaluation Protocol. Known misleading features are listed on the RecyClass Methodology and the following size indications can be considered to ensure the recognition of PP:

- Size of non-PP detectable surfaces on containers > 500 ml: < 70% coverage
- Size of non-PP detectable surfaces on containers < 500 ml: < 50% coverage

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Material:

- PET-bottles
- PET-trays
- PP rigids
  - Coloured
- PP flexibles
- PE rigids
- PE flexibles
- PS
- Paper & cardboard
- Beverage cartons
- Glass
- Steel
- Aluminium

		Class A-B Full compatibility for reprocessing	Class B-C Limited compatibility for reprocessing	Non-recyclable Low (or no) compatibility for reprocessing
Main body	Main Material*	PP	PE ≤ 10%	Multilayers with PLA; PVC; PS; PET; PETG; PE > 10%
	Material composition	A when PP content is > 95%; B when PP content is > 90% and all packaging features are FULLY compatible with recycling	C when PP content is > 70% and all packaging features are FULLY compatible with recycling	D when PP content is > 50%; E when PP content is > 30%; F when PP content is <30%
	Colours	All colours	Black inner layer and dark colours (NIR-detectable)	Non NIR detectable colours
	Size		Items compacted < 5 cm	Items compacted < 2 cm
	Colours	All colours	Black inner layer and dark colours (NIR-detectable)	Non NIR detectable colours
	Product residues Easy to empty index	A if the index is < 5%; B if the index is < 10%	C if the index is < 15%	D if the index is < 20%; E < if the index is 25%; F if the index is > 25%
	Barrier	EVOH ≤ 6% + PP-g -MAH tie layers with MAH ≥ 0.1wt% and EVOH:tie layers ratio ≤ 2;	EVOH > 6% + PP-g -MAH tie layers with MAH ≥ 0.1wt% and EVOH:tie layers ratio ≤ 2; EVOH <= 1% with any other tie layers	EVOH > 1% with different tie layers; PA; PVDC; Aluminium
	Additives	Additives that are unavoidable in processing (stabilizers, antioxidants, lubricants, nucleating agents, peroxides) and density remains <0,97 g/cm³	Mineral fillers ($CaCO_3$, talc) not increasing density more than 0,97 g/cm³	Additives changing the material density > 1 g/cm³ Flame-retardant additives, plasticizers Bio-/oxo-/photodegradable additives
Attachments	Closure Systems	PP	HDPE; LDPE; LLDPE; MDPE; PET; PETG; PLA; PS (all with a density > 1 g/cm³); Removable aluminium lidding	Non-PO and/or foams with density <1g/cm3; Aluminium; Metal; PVC
	Liners, Seals and Valves	PP; TPO < 1wt%; TPS < 1wt%	HDPE; LDPE; LLDPE; MDPE; TPE-PE; PET, PETG, PS, PLA (all with a density >1g/cm3); Removable silicon with a density > 1 g/cm³; PO foamed ≤ 1%	Non-PO and/or foams with density <1g/cm3; Any other TPE Aluminium; Metal; Foiled paper; PVC
	Other Components	PP	PE with density <1 g/cm³; PET; PETG; PS; PLA all with density >1 g/cm³; Electroplating on attachments (with density >1 g/cm³)	Aluminium; PVC; Glass components; Non-PO and /or foams with density < 1 g/cm3
Decoration**	Inks	Non-bleeding inks compliant with EuPIA Exclusion Policy		Inks that bleed; Inks non-compliant with EuPIA Exclusion Policy; PVC binders
	Sleeves	Sleeves in PO (all with density < 1 g/cm³), Self-separable plastic and carboard sleeves under mechanical stress (sorting test mandatory)	Sleeves in PE (with density < 1 g/cm³); Sleeves in PET, PETG, PET-C, PLA, PS (all with density > 1 g/cm³), Carboard sleeves without fiberloss (sorting test mandatory)	Sleeves that hinder the recognition of the PP; Sleeves in non PO-materials with density < 1 g/cm³ ; Cardboard sleeves with fibreloss during recycling process; Aluminium; Metallised Sleeves; PVC; Heavily inked sleeves;
	Labels	Labels in PP (all with density < 1 g/cm³) In-Mould-Labels in PP printed with < 1 wt% of the total packaging (except dark colours and bleeding inks)	Labels in PE, PO (with density < 1 g/cm³); Labels in PET, PETG, PLA, PS (all with density > 1 g/cm³); Labels in Paper without fibreloss; PO-foamed labels Any other In-Mould-Labels in PP (except bleeding inks)	Labels that hinder the recognition of the PP; Labels in non PO-materials with density < 1 g/cm³ ; Paper labels with fibreloss during recycling process Aluminium; Metallised labels; PVC Cardboard or paper in In-Mould-Labels;
	Adhesives for labels	Water soluble or water releasable adhesive (@ less than 40°C)	Non-water soluble or non-releasable adhesive approved by RecyClass in combination with filmic PO labels	Non water soluble or water releasable adhesives
	Direct Printing	Laser marked; Production or best-before date, Direct printing (inks + lacquer) representing <1wt% of the total packaging (except dark colours)	Any other direct printing, Cold transfer and hot stamping technologies that does not hinder the recognition of the underlaying PP-polymer	
	Other Decorative Technolgies		Electroplating on attachments (with density > 1 g/cm³)	Electroplating on attachments (with density <1 g/cm³)

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**Temporary solution

*** Temporary solution. New recommendations will be given when test campaign is completed.

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Material:

- PET-bottles
- PET-trays
- PP rigids
- PP flexibles
  - Transparent
- PE rigids
- PE flexibles
- PS
- Paper & cardboard
- Beverage cartons
- Glass
- Steel
- Aluminium

		Class A-B Full compatibility for reprocessing	Class B-C Limited compatibility for reprocessing	Non-recyclable Low (or no) compatibility for reprocessing
Main body	Main Material*	PP	Multilayer PP/PE with PE ≤ 10%	Any other polymer (e.g. PET, PVC, etc.)
	Material composition	A when PP content is > 95%; B when PE content is > 90% and all packaging features are FULLY compatible with recycling	C when PP content is > 70% and all packaging features are FULLY compatible with recycling	D when PP content is > 50%; E when PP content is> 30%; F when PP content is < 30%
	Colours	Unpigmented; transparent	Light colours; translucent colours	Dark colours; black; carbon black
	Size	> A4 or > 50 x 50 mm once compacted	< A4 format or between 20 x 20 and 50 x 50 mm once compacted (sorting test)	< 20 x 20 mm
	Product residues Easy to empty index	A if the index is < 5%; B if the index is < 10%	C if the index is < 15%	D if index is < 20%; E < if index is 25%; F if index is > 25%
	Barrier	SiOx and AlOx without additional coatings	≤ 5% EVOH (in polyolefinc combination film); metallized layers without coatings	Barrier layer PVC, PVDC, PA; any other barrier layer; foaming agents used as expandant chemical agents; aluminium
	Additives	Additives that do not increase the density higher than 0,97 g/cm³		Bio-/oxo-/photodegradable additives Additives that do increase the density higher than 0,97 g/cm³ ($CaCO_3$, talc, glass fibers, etc.)
	Laminating Adhesives***	Laminating adhesives approved as fully compatible by RecyClass; Recycling test required if in combination with a barrier material	Laminating adhesives approved as limited compatible by RecyClass; Recycling test required if in combination with a barrier material	Any other laminating adhesives
Attachments	Closure Systems	PP	PE	Metal, aluminium, PVC,PET, PETG, PS, PLA, non PO or foams with density < 1 g/cm3
	Liners, Seals and Valves	PP	PE, removable aluminium liddings	Metal, aluminium, PVC, PET, PETG, PS, PLA, foiled paper, non PO or foams with density < 1 g/cm3
	Other Attachments	PP	PE	Metal, aluminium, PVC, PET, PETG, PS, PLA, paper, foams with density < 1 g/cm³
Decoration*	Labels	PP	PE	Metallized labels, any other; paper labels
	Adhesives	Water soluble or water-releasable at less than 40°C		Adhesives non-soluble in water or non-releasable in water at less than 40°C
	Inks	Non-bleeding inks compliant with EuPIA Exclusion Policy		Inks that bleed; Inks non-compliant with EuPIA Exclusion Policy
	Direct Printing	Laser marked print; Printed production or expiry date	Printing covering < 50%**	Printing covering > 50%**

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Material:

- PET-bottles
- PET-trays
- PP rigids
- PP flexibles Coloured
- PE rigids
- PE flexibles
- PS
- Paper & cardboard
- Beverage cartons
- Glass
- Steel
- Aluminium

		Class A-B Full compatibility for reprocessing	Class B-C Limited compatibility for reprocessing	Non-recyclable Low (or no) compatibility for reprocessing
Main body	Main Material*	PP	Multilayer PP/PE with PE ≤ 10%	Any other polymer (e.g. PET, PVC, etc.)
	Material composition	A when PP content is > 95%; B when PE content is > 90% and all packaging features are FULLY compatible with recycling	C when PP content is > 70% and all packaging features are FULLY compatible with recycling	D when PP content is > 50%; E when PP content is> 30%; F when PP content is < 30%
	Colours	Light colours; translucent colours	NIR-detectable colours (Sorting test)	Non-NIR detectable dark colours
	Size	> A4 or > 50 x 50 mm once compacted	< A4 format or between 20 x 20 and 50 x 50 mm once compacted (Sorting test)	< 20 x 20 mm
	Product residues Easy to empty index	A if the index is < 5%; B if the index is < 10%	C if the index is < 15%	D if index is < 20%; E < if index is 25%; F if index is > 25%
	Barrier	SiOx and AlOx without additional coatings	≤ 5% EVOH (in polyolefinc combination film); Metallization	> 5% EVOH (in polyolefinic combination film); Barrier layer PVC, PVDC, PA; any other barrier layer; foaming agents used as expandant chemical agents; aluminium
	Additives	Additives that do not increase the density higher than 0,97 g/cm³	PBT Voiding Agent <5%	Bio-/oxo-/photodegradable additives; additives increasing the density > 0,97 g/cm3 ($CaCO_3$, talc, glass fibers, etc.)
	Laminating Adhesives***	Laminating adhesives approved as fully compatible by RecyClass; Recycling test required if in combination with a barrier material	Laminating adhesives approved as limited compatible by RecyClass; Recycling test required if in combination with a barrier material	Any other laminating adhesives
Attachments	Closure Systems	PP	PE	Metal, aluminium, PVC,PET, PETG, PS, PLA, non PO or foams with density < 1 g/cm³
	Liners, Seals and Valves	PP	PE, removable aluminium lidding	Metal, aluminium, PVC, PET, PETG, PS, PLA, foiled paper, non PO or foams with density < 1 g/cm³
	Other Attachments	PP	PE	Metal, aluminium, PVC, PET, PETG, PS, PLA, paper, foams with density < 1 g/cm³
Decoration	Labels	PP	PE	Metallized labels, any other; paper labels
	Adhesives	Water soluble or water-releasable at less than 40°C		Adhesives non-soluble in water or non-releasable in water at less than 40°C
	Inks	Non-bleeding inks compliant with EuPIA Exclusion Policy		Inks that bleed; Inks non-compliant with EuPIA Exclusion Policy
	Direct Printing	Laser marked print; Printed production or expiry date; printing covering < 50%**	Printing covering > 50%**	

Last update: January 2023

Design For Recycling

GUIDELINES for packaging

*Polymer resin can be either fossil- or bio-based, virgin or recycled.

** Decorative technologies must not hinder the recognition of the underlaying PE-polymer. Features as size, print, mass colouration and/or barrier might require to perform a Sorting Evaluation Protocol. Known misleading features are listed on the RecyClass Methodology and the following size indications can be considered to ensure the recognition of PE:
– Size of non-PE detectable surfaces on containers > 500 ml: < 70% coverage
– Size of non-PE detectable surfaces on containers < 500 ml: < 50% coverage

CIRCPACK by VEOLIA

Material:

- PET-bottles
- PET-trays
- PP rigids
- PP flexibles

PE rigids
Natural & White

- PE flexibles
- PS
- Paper & cardboard
- Beverage cartons
- Glass
- Steel
- Aluminium

		Class A-B Full compatibility for reprocessing	Class B-C Limited compatibility for reprocessing	Non-recyclable Low (or no) compatibility for reprocessing
Main body	Main Material*	HDPE; Multilayer PE with HDPE prevalence (LLDPE, LDPE, MDPE)	PP ≤ 10%	Multilayers HDPE with PLA; PVC; PS; PET; PETG; 10% < PP ≤ 30% (- 2 classes); PP > 30% (-3 classes)
	Material composition	A when PE content is > 95%; B when PE content is > 90% and all packaging features are FULLY compatible with recycling	C when PE content is > 70% and all packaging features are FULLY compatible with recycling	D when PE content is > 50%; E when PE content is > 30%; F when PE content is <30%
	Colours	Natural (clear); White	Light colours	Black Inner layer; Black; Carbon Black; Other dark colours
	Size		Items compacted < 5 cm	Items (compacted) < 2 cm
	Product residues Easy to empty index	A if the index is < 5%; B if the index is < 10%	C if the index is < 15%	D if the index is < 20%; E < if the index is 25%; F if the index is > 25%
	Barrier	EVOH ≤ 6.0%wt + PE-g-MAH tie layers with MAH > 0.1%wt and EVOH:tie layer ratio ≤ 2; Enkase (fluorination); In-mould fluorination	EVOH > 6.0%wt + PE-g-MAH tie layers with MAH > 0.1%wt and EVOH:tie layer ratio ≤ 2; EVOH ≤ 1% with any other tie layers; Plasma fluorination	EVOH > 1% with any other tie layers; PA; PVDC; Plasma Fluorination; Aluminium
	Additives	Additives that are unavoidable in processing (stabilizers, antioxidants, lubricants, nucleating agents, peroxides) and density remains < 0,97 g/cm³	Mineral fillers ($CaCO_3$, talc) not increasing density more than 0,97 g/cm³	Additives changing the material density > 1 g/cm³; Flame-retardant additives, plasticizers; Bio-/oxo-/photodegradable additives
Attachments	Closure Systems	HDPE; LDPE; LLDPE; MDPE	PP; PET; PETG; PLA; PS (all with a density > 1 g/cm³); Removable aluminium lidding	Non-PO and/or foams with density <1g/cm³; Aluminium; Metal; PVC
	Liners, Seals and Valves	HDPE; LDPE; LLDPE; MDPE; TPO ≤ 1%; TPS ≤ 1%	PP; TPO; TPS; PET, PETG, PLA, PS (all with a density > 1 g/cm³); Removable silicon with a density > 1 g/cm³, PO foamed ≤ 1%	Non-PO and/or foams with density <1g/cm³; Any other TPE, Aluminium; Metal; Foiled paper; PVC
	Colours	Natural (clear); White	Light colours	Black Inner layer, Black, Carbon Black, Other dark colours
Decoration**	Label materials (PSL, wet-glue labels, wrap-around labels, IML)	Labels in PE (all with density <1 g/cm³)	Labels in PP, PO (with density < 1 g/cm³); Labels in PET, PETG, PLA, PS (all with density > 1 g/cm³); Labels in Paper without fibreloss; PO foamed labels	Labels that hinder the recognition of the PE; Labels in non PO-materials with density < 1 g/cm³; Paper labels with fibreloss during recycling process; In-Mould Labels; Aluminium; Metallised labels; PVC
	Adhesives for labels	Water soluble adhesive (@ less than 40°C); Water releasable adhesive (@ less than 40°C)		Non-water soluble adhesive (@ less than 40°C); Non-water releasable adhesive (@ less than 40°C)
	Sleeves	Sleeves in PE (all with density < 1 g/cm³); Self-separable plastic and cardboard sleeves under mechanical pressure (sorting test mandatory)	Sleeves in PO (with density < 1 g/cm³); Sleeves in PET, PETG, PET-C, PLA, PS (all with density >1 g/cm³); Cardboard sleeves without fiberloss (sorting test mandatory)	Sleeves that hinder the recognition of the PE; Sleeves in non PO-materials with density <1 g/cm3 ; Cardboard sleeves with fibreloss during recycling process; Aluminium; Metallised sleeves; Heavily inked sleeves; PVC
	Inks	Non-bleeding inks compliant with EuPIA Exclusion Policy		Inks that bleed; Inks non-compliant with EuPIA Exclusion Policy; PVC binders
	Direct Printing	Laser marked; Production or best-before date		Any other direct printing
	Other Components (and decorative technologies)	HDPE, LDPE, LLDPE, MDPE	PP; PET; PETG; PS; PLA all with density >1 g/cm³; Electroplating on attachments (with density > 1 g/cm³)	Aluminium; PVC; Glass components; Foams with density < 1 g/cm³; Electroplating on attachments (with density < 1 g/cm³)

Last update: January 2023

Design For Recycling

GUIDELINES for packaging

*Polymer resin can be either fossil- or bio-based, virgin or recycled.

* Decorative technologies must not hinder the recognition of the underlaying PE-polymer. Features as size, print, mass colouration and/or barrier might require to perform a Sorting Evaluation Protocol. Known misleading features are listed on the RecyClass Methodology and the following size indications can be considered to ensure the recognition of PE:
– Size of non-PE detectable surfaces on containers > 500 ml: < 70% coverage
– Size of non-PE detectable surfaces on containers < 500 ml: < 50% coverage

CIRCPACK by VEOLIA

Material:

- PET-bottles
- PET-trays
- PP rigids
- PP flexibles
- **PE rigids** Coloured
- PE flexibles
- PS
- Paper & cardboard
- Beverage cartons
- Glass
- Steel
- Aluminium

		Class A-B Full compatibility for reprocessing	Class B-C Limited compatibility for reprocessing	Non-recyclable Low (or no) compatibility for reprocessing
Main body	Main Material*	HDPE; Multilayer PE with HDPE prevalence (LLDPE, LDPE, MDPE)	PP ≤ 10%	Multilayers HDPE with PLA; PVC; PS; PET; PETG; 10% < PP ≤ 30% (- 2 classes); PP > 30% (-3 classes)
	Material composition	A when PE content is > 95%; B when PE content is > 90% and all packaging features are FULLY compatible with recycling	C when PE content is > 70% and all packaging features are FULLY compatible with recycling	D when PE content is > 50%; E when PE content is > 30%; F when PE content is <30%
	Colours	All other colours	Black inner layer and dark colours (NIR-detectable)	Non NIR-detectable colours
	Size		Items compacted < 5 cm	Items (compacted) < than 2 cm
	Product residues Easy to empty index	A if the index is < 5%; B if the index is < 10%	C if the index is < 15%	D if the index is < 20%; E < if the index is 25%; F if the index is > 25%
	Barrier	EVOH ≤ 6.0%wt + PE-g-MAH tie layers with MAH > 0.1%wt and EVOH:tie layer ratio ≤ 2; Enkase (fluorination); In-mould fluorination	EVOH > 6.0%wt + PE-g-MAH tie layers with MAH > 0.1%wt and EVOH:tie layer ratio ≤ 2; EVOH ≤ 1% with any other tie layers; Plasma fluorination	EVOH > 1% with any other tie layers; PA; PVDC; Aluminium
	Additives	Additives that are unavoidable in processing (stabilizers, antioxidants, lubricants, nucleating agents, peroxides) and density remains < 0,97 g/cm³	Mineral fillers ($CaCO_3$, talc) not increasing density more than 0,97 g/cm³	Additives changing the material density > 1 g/cm³; Flame-retardant additives, plasticizers; Bio-/oxo-/photodegradable additives
Attachments	Closure Systems	HDPE; LDPE; LLDPE; MDPE	PP; PET; PETG; PLA; PS (all with a density > 1 g/cm³); Removable aluminium lidding	Non-PO and/or foams with density <1g/cm³; Aluminium; Metal; PVC
	Liners, Seals and Valves	HDPE; LDPE; LLDPE; MDPE; TPO ≤ 1%; TPS ≤ 1%	PP; TPO; TPS; PET, PETG, PLA, PS (all with a density > 1 g/cm³); Removable silicon with a density > 1 g/cm³, PO foamed ≤ 1%	Non-PO and/or foams with density <1g/cm³; Any other TPE, Aluminium; Metal; Foiled paper; PVC
Decoration**	Label materials (PSL, wet-glue labels, wrap-around labels, IML)	Labels in PE (all with density < 1 g/cm³); In-Mould-Labels in PE printed with < 1 wt% of the total packaging (except dark colours and bleeding inks)	Labels in PP, PO (with density < 1 g/cm³); Labels in PET, PETG, PLA, PS (all with density > 1 g/cm³); Labels in Paper without fibreloss; PO-foamed labels; Any other In-Mould-Labels in PE (except bleeding inks)	Labels that hinder the recognition of the PE; Labels in non PO-materials with density < 1 g/cm³; Paper labels with fibreloss during recycling process; Cardboard or paper In-Mould-Labels; Aluminium; Metallised labels; PVC
	Adhesives for labels	Water soluble adhesive (@ less than 40°C); Water releasable adhesive (@ less than 40°C)	Non-water soluble or non-releasable adhesive approved by RecyClass in combination with filmic PO labels	Non-water soluble adhesive (@ less than 40°C); Non-water releasable adhesive (@ less than 40°C)
	Sleeves	Sleeves in PE (all with density < 1 g/cm³); Self-separable plastic and cardboard sleeves under mechanical pressure (sorting test mandatory)	Sleeves in PO (with density < 1 g/cm³); Sleeves in PET, PETG, PET-C, PLA, PS (all with density >1 g/cm³); Cardboard sleeves without fiberloss (sorting test mandatory)	Sleeves that hinder the recognition of the PE; Sleeves in non PO-materials with density < 1 g/cm³; Cardboard sleeves with fibreloss during recycling process; Aluminium; Metallised sleeves; Heavily inked sleeves; PVC
	Inks	Non-bleeding inks compliant with EuPIA Exclusion Policy		Inks that bleed; Inks non-compliant with EuPIA Exclusion Policy; PVC binders
	Direct Printing	Laser marked; Direct printing (inks + lacquer) representing < 1 wt% of the total packaging (except dark colours)	Any other direct printing; Cold transfer and hot stamping technologies that does not hinder the recognition of the underlaying PE-polymer	
	Other Components (and decorative technologies)	HDPE, LDPE, LLDPE, MDPE	PP PET; PETG; PS; PLA all with density >1 g/cm³; Electroplating on attachments (with density > 1 g/cm³)	Aluminium; PVC; Glass components; Foams with density < 1 g/cm³; Electroplating on attachments (with density < 1 g/cm³)

Last update: January 2023

Design For Recycling

GUIDELINES for packaging

*Polymer resin can be either fossil- or bio-based, virgin or recycled.

**Temporary solution

*** Guidelines are non-company specifics. Barrier structures compatible with recycling are listed in RecyClass Approval page.

CIRCPACK by VEOLIA

Material:

- PET-bottles
- PET-trays
- PP rigids
- PP flexibles
- PE rigids

PE flexibles Transparent

- PS
- Paper & cardboard
- Beverage cartons
- Glass
- Steel
- Aluminium

		Class A-B Full compatibility for reprocessing	Class B-C Limited compatibility for reprocessing	Non-recyclable Low (or no) compatibility for reprocessing
Main body	Main Material*	PE-LD, PE-LLD; PE-HD	Multilayer PE/PP with PP ≤ 5%	Multilayer PE/PP with PP > 5%; Any other polymer (e.g. PET, PVC, etc.)
	Material composition	A when PE content is > 95%; B when PE content is > 90% and all packaging features are FULLY compatible with recycling	C when PE content is > 70% and all packaging features are FULLY compatible with recycling	D when PE content is > 50%; E when PE content is > 30%; F when PE content is <30%
	Colours	Unpigmented; transparent	Light colours; translucent colours	Dark colours; black; carbon black
	Size	> A4 or > 50 x 50 mm once compacted	< A4 format or between 20 x 20 and 50 x 50 mm once compacted (Sorting test)	< 20 x 20 mm
	Product residues Easy to empty index	A if the index is < 5%; B if the index is < 10%	C if the index is < 15%	D if index is < 20%; E < if index is 25%; F if index is > 25%
	Barrier***	SiOx and AlOx without additional coatings	≤ 5% EVOH (in polyolefinc combination film); ≤ 15% PA 6/66 copolymer with melting temperature < 192°C and incoporating ≥ 10% PE-g-MAH tie layers	> 5% EVOH (in polyolefinc combination film); Any other PA barrier layer PVC, PVDC; any other barrier layer; Foaming agents used as expanding chemical agents; aluminium
	Additives	Additives that do not increase the density higher than 0,97 g/cm³		Bio-/oxo-/photodegradable additives Additives that do increase the density higher than 0,97 g/cm³ ($CaCO_3$, talc, glass fibers, etc.)
	Laminating Adhesives	Laminating adhesives approved as fully compatible by RecyClass; Recycling test required if in combination with a barrier material	Aliphatic polyurethanes ≤ 2.5%; Laminating adhesives approved as limited compatible by RecyClass; Recycling test required if in combination with a barrier material	Aliphatic polyurethanes >2.5%; Aromatic polyurethanes & Water-based acrylics; Laminating adhesives specifically developed for PET and/or Aluminium in combination with PE; Any other laminating adhesives (Epoxy, etc.)
Attachments	Closure Systems	PE-LD, PE-LLD, PE-HD	PP	Metal, aluminium, PVC, PET, PETG, PS, PLA, non PO or foams with density < 1 g/cm³
	Liners, Seals and Valves	PE-LD, PE-LLD, PE-HD	PP, removable aluminium liddings	Metal, aluminium, PVC, PET, PETG, PS, PLA, foiled paper, non PO or foams with density < 1 g/cm³
	Other Attachments	PE-LD, PE-LLD, PE-HD	PP	Metal, aluminium, PVC, PET, PETG, PS, PLA, paper, foams with density < 1 g/cm³
Decoration	Labels	PE	PP	Metallized labels, any other; paper labels
	Adhesives	Water soluble or water-releasable at less than 40°C		Adhesives non-soluble in water or non-releasable in water at less than 40°C
	Inks	Non-bleeding inks compliant with EuPIA Exclusion Policy		Inks that bleed; Inks non-compliant with EuPIA Exclusion Policy
	Direct Printing	Laser marked print; Printed production or expiry date	Printing covering < 50%**	Printing covering > 50%**

Last update: January 2023

Design For Recycling

GUIDELINES for packaging

*Polymer resin can be either fossil- or bio-based, virgin or recycled.

**Temporary solution

*** Guidelines are non-company specifics. Barrier structures compatible with recycling are listed in RecyClass Approval page.

CIRCPACK by VEOLIA

Material:

- PET-bottles
- PET-trays
- PP rigids
- PP flexibles
- PE rigids

PE flexibles Coloured

- PS
- Paper & cardboard
- Beverage cartons
- Glass
- Steel
- Aluminium

		Class A-B Full compatibility for reprocessing	Class B-C Limited compatibility for reprocessing	Non-recyclable Low (or no) compatibility for reprocessing
Main body	Main Material*	PE-LD, PE-LLD; PE-HD	Multilayer PE/PP with PP ≤ 5%	Multilayer PE/PP with PP > 5%, Any other polymer (e.g. PET, PVC, etc.)
	Material composition	A when PE content is > 95%; B when PE content is > 90% and all packaging features are FULLY compatible with recycling	C when PE content is > 70% and all packaging features are FULLY compatible with recycling	D when PE content is > 50%; E when PE content is > 30%; F when PE content is <30%
	Colours	light colours; translucent colours	NIR-detectable dark colours (Sorting test)	Non NIR-detectable dark colours
	Size	> A4 or > 50 x 50 mm once compacted	< A4 format or between 20 x 20 and 50 x 50 mm once compacted (Sorting test)	< 20 x 20 mm
	Product residues Easy to empty index	A if the index is < 5%; B if the index is < 10%	C if the index is < 15%	D if index is < 20%; E < if index is 25%; F if index is > 25%
	Barrier***	SiOx and AlOx without additional coatings	≤ 5% EVOH (in polyolefinic combination film); Metallisation; PVOH ≤ 1%; ≤ 15% PA 6/66 copolymer with melting temperature < 192 °C and incorporating ≥ 10% PE-g-MAH tie layers	> 5% EVOH (in polyolefinc combination film); any other PA barrier layer PVC, PVDC; any other barrier layer; foaming agents used as expanding chemical agents; aluminium
	Additives	Additives that do not increase the density higher than 0,97 g/cm³		Bio-/oxo-/photodegradable additives Additives that do increase the density higher than 0,97 g/cm³ ($CaCO_3$, talc, glass fibers, etc.)
	Laminating Adhesives	Polyurethanes and water-based acrylics ≤ 3%; Laminating adhesives approved as fully compatible by RecyClass; Recycling test required if in combination with a barrier material	Polyurethanes and water-based acrylics 3-5%; Laminating adhesives approved as limited compatible by RecyClass; Recycling test required if in combination with a barrier material	Polyurethanes and water-based acrylics >5%; Laminating adhesives specifically developed for PET and/or Aluminium in combination with PE; Any other laminating adhesives (Epoxy, etc.)
Attachments	Closure Systems	PE-LD, PE-LLD, PE-HD	PP	Metal, aluminium, PVC, PET, PETG, PS, PLA, non PO or foams with density < 1 g/cm3
	Liners, Seals and Valves	PE-LD, PE-LLD, PE-HD	PP, removable aluminium lidding	Metal, aluminium, PVC, PET, PETG, PS, PLA, foiled paper, non PO or foams with density < 1 g/cm³
	Other Attachments	PE-LD, PE-LLD, PE-HD	PP	Metal, aluminium, PVC, PETG, PS, PLA, paper, foams with density < 1 g/cm³
Decoration	Labels	PE	PP	Metallized labels, any other; paper labels
	Adhesives	Water soluble or water-releasable at less than 40°C		Adhesives non-soluble in water or non-releasable in water at less than 40°C
	Inks	Non-bleeding inks compliant with EuPIA Exclusion Policy		Inks that bleed; Inks non-compliant with EuPIA Exclusion Policy
	Direct Printing	Laser marked print; Printed production or expiry date; printing covering < 50%**	Printing covering > 50%**	

Last update: January 2023

Design For Recycling

GUIDELINES for packaging

*Polymer resin can be either fossil- or bio-based, virgin or recycled.

**Decorative technologies must not hinder the recognition of the underlaying PS-polymer. Features as size, print, mass colouration and/or barrier might require to perform a Sorting Evaluation Protocol. Known misleading features are listed on the RecyClass Methodology and the following size indications can be considered to ensure the recognition of PS:
– Size of non-PS detectable surfaces on containers > 500 ml: < 70% coverage
– Size of non-PS detectable surfaces on containers < 500 ml: < 50% coverage

CIRCPACK by VEOLIA

Material:

- PET-bottles
- PET-trays
- PP rigids
- PP flexibles
- PE rigids
- PE flexibles
- **PS** Natural & White
- Paper & cardboard
- Beverage cartons
- Glass
- Steel
- Aluminium

		Class A-B Full compatibility for reprocessing	Class B-C Limited compatibility for reprocessing	Non-recyclable Low (or no) compatibility for reprocessing
Main Body	Main Material*	PS		PS foamed < 1 g/cm³; Multilayers (e.g. PET, PETG, PVC, PLA, HDPE, PP)
	Material composition	A when PS content is > 95%; B when PS content is > 90% and all packaging features are FULLY compatible with recycling	C when PS content is > 70% and all packaging features are FULLY compatible with recycling	D when PS content is > 50%; E when PS content is> 30%; F when PS content is < 30%
	Colours	Natural, white		Any other colour
	Size		Items compacted < 5 cm	Items compacted < 2 cm
	Product residues	A if the index is < 5%; B if the index is < 10%	C if the index is < 15%	D if the index is < 20%; E < if the index is 25%; F if the index is >
	Barrier		EVOH	PA; PVdC
	Additives	Additives that are unavoidable in processing (stabilizers, antioxidants, lubricants, nucleating agents, peroxides) and in formulation (SBS copolymer) with density remains between 1 and 1,07 g/cm³	Mineral fillers (CaCO3, talc) not increasing density > 1,07 g/cm³	Additives increasing density > 1,07 g/cm³; Bio/oxo/photodegradable additives
Attachments	Closure System	Unprinted natural or white PS	Removable PP and/or PE	Printed PS; PET; PETG; PVC; PLA; Paper; Any other material with density >1 g/cm³; Non detaching or welded closures; Aluminium; metal
	Liner, seals and valves	Natural or white PS	PP; PE; EVA; TPE (non welded and with density <1 g/cm³)	Coloured PS; PET; PETG; PVC; PLA; Any other material with density >1 g/cm³; Metal; metal foil; silicone
	Lids	Unprinted natural or white PS	Removable aluminium lidding; Removable PP and/or PE	Printed PS; PVC; Non removable aluminium lidding; Paper; PET. Multilayer PET/paper or PET/PS; Any other material with density >1 g/cm³
Decoration**	Inks	Non-bleeding inks compliant with EuPIA Exclusion Policy		Inks that bleed; Inks non compliant with EuPIA Exclusion Policy; PVC binders
	Label materials (PSL, wet-glue labels, wrap-around labels, IML)	Labels in PS	Labels in PP, PE (with density < 1 g/cm³) not hampering the NIR detection (sorting test mandatory)	Labels that hinder the recognition of the PS; PET, PETG, PVC, PLA; Paper label; In-Mould-Labels; Metallised materials; Aluminium
	Adhesive for labels	Water soluble adhesive (@ less than 40°C); Water releasable adhesive (@ less than 40°C)		Non-water soluble adhesive (@ less than 40°C); Non-water releasable adhesive (@ less than 40°C)
	Sleeves	Sleeves in PS; Self-separable plastic and cardboard sleeves under mechanical pressure (sorting test mandatory)	Sleeves in PE, PO (with density <1 g/cm³) not hampering the NIR detection (sorting test mandatory)	Sleeves that hinder the recognition of the PS; PET; PETG; PVC; PLA; Cardboard sleeves; Metallised materials; Heavily inked sleeves; Aluminium
	Direct printing	Laser marked; Production or best-before date;		Any other direct printing
	Other components	Unprinted natural or white PS	Removable PP and/or PE	Printed PS; PET, PETG, PVC, PLA, metal, metal foil, paper; Any other material with density >1 g/cm³

PS is only being recycled in a limited number of countries

Last update: January 2023

Design For Recycling

GUIDELINES for packaging

*Polymer resin can be either fossil- or bio-based, virgin or recycled.

**Decorative technologies must not hinder the recognition of the underlaying PS-polymer. Features as size, print, mass colouration and/or barrier might require to perform a Sorting Evaluation Protocol. Known misleading features are listed on the RecyClass Methodology and the following size indications can be considered to ensure the recognition of PS:
– Size of non-PS detectable surfaces on containers > 500 ml: < 70% coverage
– Size of non-PS detectable surfaces on containers < 500 ml: < 50% coverage

CIRCPACK by VEOLIA

Material:

- PET-bottles
- PET-trays
- PP rigids
- PP flexibles
- PE rigids
- PE flexibles
- **PS** Coloured
- Paper & cardboard
- Beverage cartons
- Glass
- Steel
- Aluminium

		Class A-B Full compatibility for reprocessing	Class B-C Limited compatibility for reprocessing	Non-recyclable Low (or no) compatibility for reprocessing
Main Body	Main Material*	PS		PS foamed < 1 g/cm³; Multilayers (e.g. PET, PETG, PVC, PLA, HDPE, PP)
	Material composition	A when PS content is > 95%; B when PS content is > 90% and all packaging features are FULLY compatible with recycling	C when PS content is > 70% and all packaging features are FULLY compatible with recycling	D when PS content is > 50%; E when PS content is> 30%; F when PS content is < 30%
	Colours	Light colours	Dark colours (NIR detectable)	Non NIR detectable colours
	Size		Items compacted < 5 cm	Items compacted < 2 cm
	Product residues	A if the index is < 5%; B if the index is < 10%	C if the index is < 15%	D if the index is < 20%; E < if the index is 25%; F if the index is >
	Barrier		EVOH	PA; PVdC
	Additives	Additives that are unavoidable in processing (stabilizers, antioxidants, lubricants, nucleating agents, peroxides) and in formulation (SBS copolymer) with density remains between 1 and 1,07 g/cm³	Mineral fillers (CaCO3, talc) not increasing density > 1,07 g/cm³	Additives increasing density > 1,07 g/cm³; Bio/oxo/photodegradable additives
Attachments	Closure System	PS	Removable PP and/or PE, paper without fiberloss	PET; PETG; PVC; PLA; Paper with fiberloss; Any other material with density >1 g/cm3; Non-detaching or welded closures; Aluminium; metal
	Liner, seals and valves	PS	PP; PE; EVA; TPE (non welded and with density <1 g/cm³)	PET; PETG; PVC; PLA; Any other material with density >1 g/cm³; Metal; metal foil; silicone
	Lids	PS	Removable PP and/or PE; Removable aluminium lidding; Paper without fiberloss	PVC; Aluminium foil; paper with fiberloss; Multilayer PET/paper or PET/PS; Any other material with density >1 g/cm³
Decoration**	Inks	Non-bleeding inks compliant with EuPIA Exclusion Policy		Inks that bleed; Inks non compliant with EuPIA Exclusion Policy; PVC binders
	Label materials (PSL, wet-glue labels, wrap-around labels, IML)	Labels in PS	Labels in PP, PE (with density < 1 g/cm³); Label in paper without fiberloss	Labels that hinder the recognition of the PS; PET; PETG; PVC; PLA; Paper with fiberloss; In-Mould-Labels; Metallised materials; Aluminium
	Adhesive for labels	Water soluble adhesive (@ less than 40°C); Water releasable adhesive (@ less than 40°C)		Non-water soluble adhesive (@ less than 40°C); Non-water releasable adhesive (@ less than 40°C)
	Sleeves	Sleeves in PS; Self-separable plastic and cardboard sleeves under mechanical pressure (sorting test mandatory)	Sleeves in PE, PO (with density < 1 g/cm³); Cardboard sleeves without fiberloss (sorting test mandatory)	Sleeves that hinder the recognition of the PS; PET; PETG; PVC; PLA; Cardboard sleeves with fibreloss during recycling process; Metallised materials; Heavily inked sleeves; Aluminium
	Direct printing	Laser marked; Production or best-before date; Direct printing (inks + lacquer) representing < 1 wt% of the total packaging (except dark colours)	Any other direct printing	
	Other components	PS	Removable PP and/or PE; paper without fiberloss	PET; PETG; PVC; PLA; metal; metal foil; any other material with density >1 g/cm³

PS is only being recycled in a limited number of countries

Last update: January 2023

Design For Recycling

GUIDELINES for packaging

CIRCPACK by VEOLIA

Material:

- PET-bottles
- PET-trays
- PP rigids
- PP flexibles
- PE rigids
- PE flexibles
- PS

Paper & cardboard

- Beverage cartons
- Glass
- Steel
- Aluminium

	Class A-B Full compatibility for reprocessing	Class C Limited compatibility for reprocessing	Non-recyclable Low (or no) compatibility for reprocessing
General bale quality requirements (according to DIN643)	Natural fibre-based paper and board suitable for recycling Normal component of paper: filling material, starch, coating colourants, binding materials and additives compatible with recycling process	Unwanted material (outthrows) max 1.5% Non-paper components, paper and board not according to grade defintion, 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	Wood-based fibres; Other fibre sources leading to similar pulp quality as wood-based fibres	Other fibre sources leading to different pulp quality as wood-based fibres (bamboo, grass, hemp, etc.) Compostable separable component (such as cellulosic-film window)	Non-separable plastic components & aluminium during reprocessing
Colours		Paper suitable for de-inking	Paper not suitable for de-inking
Barriers (coating, lamination,...)	Without coating or lamination Adhesive lamination with water-soluble adhesives / water soluble coatings	One-sided plastic coating/laminate, if fibre content is > the country specific threshold, Metallisation (70%) of the surface Hot stamping or cold transfert Adhesive lamination inside of packaging (PET, mPET, PET/PE)	Two-sided plastic coating/laminate, if fibre content < country specific threshold, Polymers with low shear strenght that break down in pulper PVC coating Silicone or wax coating
Labels and Adhesives	Hotmelts with a softening point > 68°C and layer thickness of > 120µm	Water soluble adhesives	Insoluble adhesives; heavy foils; Latex/Hotmelt; Hotmelts with a softening point < 68°C
Fillers, Additives & Agents	Mineral fillers (talc, kaolin, TiO_2, starch, calcium carbonate); Wet strength agents without negative impact on fibre recovery and recycling Dry strenght agents (starch, polyvinylamine and GPAM)		Wet strength agents with negative or unproven impact on fibre recovery and recycling; Siliconizing agents
Inks & decorations	Non toxic following the EuPIA Guidlines Water-based inks and varnishes Liquid & dry toners Solvent-based inks and varnishes	Metallic decoration (e.g. hot/cold foil transfer)	Inks that bleed; toxic or hazardous inks (Inks that are on the EuPIA exclusion list); mineral-oil based colours; UV curing inks and varnished; plasticised inks. PP/PET metalized laminates; PET metalized films

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

Last update - December 2022

Design For Recycling

GUIDELINES for packaging

CIRCPACK by VEOLIA

Material:

- PET-bottles
- PET-trays
- PP rigids
- PP flexibles
- PE rigids
- PE flexibles
- PS
- Paper & cardboard

Beverage cartons

- Glass
- Steel
- Aluminium

	Class A-B Full compatibility for reprocessing	Class C Limited compatibility for reprocessing	Non-recyclable Low (or no) compatibility for reprocessing
Main Material: cardboard	A when>95% fibres, B when >90% fibres	>70% fibres	<50% fibres
Colours	All detectable light colours		Carbon black or other non-detectable colours
Plastics (Barrier, coating & closure system)	Clay / pigment coating *Of the weight of plastics used:* - >95% PE & <4% PP - <6.0 wt% EVOH + PE-g-MAH tie layers with MAH > 0.1wt% and EVOH:tie layers ratio ≤ 2 - AlOx, SiOX <5%	*Of the weight of plastics used:* - 4% < PP < 10% - >6.0% PE-g-MAH tie layers with MAH > 0.1wt% and EVOH:tie layers ratio ≤ 2 - EVOH < 1% with any other tie layer - AlOx, SiOX >5%	Wax, any other barrier solution except aluminium and polyolefins Of the weight of plastics used: - >1% EVOH with any other tie layers - Any non PO polymers in the structure (PLA, PVC, PS, PET, PETg)
Labels and Adhesives	*Material of label: refer to main material or plastics* Water soluble adhesive Hot melt adhesive (with softening temperatures >68°C)		Insoluble dispersing adhesives, Latex, hotmelt and wet-strength adhesives
Fillers, Additives & Agents	Sizing, wet end such as AKD, ASA, Rosin	Wet strength agents as far as fibre recovery and recycling is not proven (refer to pulping tests)	
Inks & Printing	Offset print - oil-based ink (vegetable) Flexo - SB / Wb Gravure - SB / Wb	Non toxic following the EuPIA Guidlines Metallized decoration Offset print - oil-based ink (mineral)	Inks that bleed; toxic or hazardous inks (Inks that are on the EuPIA exclusion list), metal inks
Other Components	Paper straw	Components of EuPIA	Biodegradable polymers

Last update - July 2022

Design For Recycling

GUIDELINES for packaging

CIRCPACK by VEOLIA

Material:

- PET-bottles
- PET-trays
- PP rigids
- PP flexibles
- PE rigids
- PE flexibles
- PS
- Paper & cardboard
- Beverage cartons
- **Glass**
- Steel
- Aluminium

	Class A-B Full compatibility for reprocessing	Class C Limited compatibility for reprocessing	Non-recyclable Low (or no) compatibility for reprocessing
Main Material	Soda-lime Glass; Ferro metals, Aluminium	Glass composites with metal or plastic layers Dealkalized Glass	Infusible materials such as Pyrex (oven-proof glass), chrystal, ceramics, stoneware, porcelain Non-magnetic metals and metals non reactive to eddy-current such as pewter, brass, stainless steel...
Colours	Transparent colours with focus on clear white, brown and green	Other transparent colours: red, purple, blue, dark green...	Opaque and dark colours such as black, dark blue
Closure Systems	Steel	Polyolefins or aluminium caps Tamper-evident rings and cork stopper RFID tags	"Swing-top" closures with ceramic or metals Any closures that cannot be fully removed from the glass packaging
Labels and Adhesives	Paper or plastic labels (other than PVC/PVdC) if associated with a non-ultra-adhesive glue	PVC/PVdC labels if associated with a non-ultra-adhesive glue	Full body sleeve Labels associated with ultra-adhesive glue
Inks			Heavy metal inks
Direct Printing	Laser engraving	Solid colours direct print on glass Metallised inks wich allow transparency	Opaque lacquer or coating
Other Components			Wax Other infusible materials

Last update - February 2022

Design For Recycling

GUIDELINES for packaging

CIRCPACK by VEOLIA

Material:

- PET-bottles
- PET-trays
- PP rigids
- PP flexibles
- PE rigids
- PE flexibles
- PS
- Paper & cardboard
- Beverage cartons
- Glass

Steel

- Aluminium

	Class A-B Full compatibility for reprocessing	Class B-C Limited compatibility for reprocessing	Non-recyclable Low (or no) compatibility for reprocessing
Main Material	steel	steel mixed with other metals stainless steel tin layer	steel mixed with copper steel mixed with lead
Size		size <45mm	size <20mm
Closure Systems	steel closure	plastic closure non-steel metal	
Labels and Adhesives	paper label	plastic label	
Inks			toxic inks (EuPIA list)
Direct Printing	engraving and direct printing		
Other Components			product residues not allowed in the collection system

Last update - January 2022

Design For Recycling

GUIDELINES for packaging

CIRCPACK by VEOLIA

Material:

- PET-bottles
- PET-trays
- PP rigids
- PP flexibles
- PE rigids
- PE flexibles
- PS
- Paper & cardboard
- Beverage cartons
- Glass
- Steel
- Aluminium

	Class A-B Full compatibility for reprocessing	Class B-C Limited compatibility for reprocessing	Non-recyclable Low (or no) compatibility for reprocessing
Main Material	aluminium	aluminium mixed with other non-ferrous metals	steel lead
Size		size <45mm (sorting > incineration)	size <20mm
Closure Systems	aluminium	plastic ferrous metals	
Labels and Adhesives	paper label	plastic label	
Inks			toxic inks (EuPIA list)
Direct Printing	engraving and direct printing		
Other Components			residues that limit the sorting product residues not allowed in the collection system

Last update - January 2022

Our services:

Expertise & certification on circular packaging

We support brand owners, packaging companies and retailers to improve recyclability of their packaging.

1

TESTS & ADVICE

Test, understand and improve the recyclability of packaging

2

CERTIFICATION

Certification of recyclability for your packaging

3

DESIGN GUIDELINES

Eco-design recommendations to optimise recyclability of packaging

4

MASTERCLASS RECYCLING

Online-training on recycling of household packaging

5

RECYCLING REPORTS

In-depth studies on strategic topics for recycling of packaging.

- Country reports
- Metal packaging
- Hospital waste
- Coffee capsules
- Flexibles
- Etc..

CIRCPACK
by VEOLIA

Expertise & certification on circular packaging

Supporting brand owners, packaging companies and retailers in their quest for circular packaging

More info?


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