

Recyclability of plastic pots and trays*

December 2022 (version 2.4)

Contents

1 Introduction and context

2 Eco-design recommendations

- Three eco-design rules to follow to make a pot or tray easier to recycle
- Recommendations for pots and trays with a PP body
- Recommendations for pots and trays with a PE body
- Recommendations for pots and trays with a clear PET body
- Recommendations for pots and trays with a coloured PET body
- Recommendations for pots and trays with a PS body
- Recommendations for pots and trays with a body made of PVC, PETG, PET/PE, etc.

3 Focus

- Dark pots and trays
- Change in density
- Absorbent pads
- CPET

4 Glossary & definitions

Please note

Some packaging items are not analysed on these slides. For example, this guide does not cover **skin-pack** lids¹ because COTREP only has limited information about these items and they need to undergo specific studies.

As far as **heat-shrink flow packs**² or **non-heat-shrink flow packs**³ are concerned, we consider that the bag is not associated with the tray and that it will be sorted separately. The eco-design recommendations for non-heat-shrink flow packs are therefore the same as those for flexible packaging items (*not included in this guide*).



1



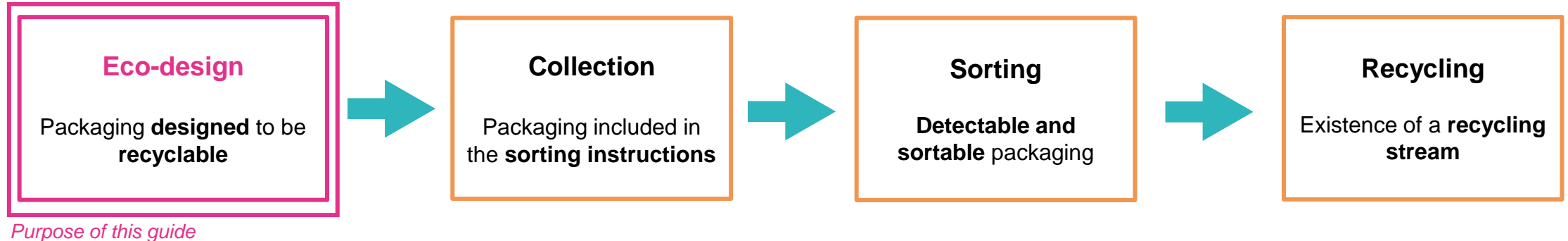
2



3

Introduction

What **conditions** must be met for a **packaging item** to be **recyclable**?



This document summarises **the COTREP eco-design recommendations to date**, aimed at **improving the recyclability of pots and trays**. It sets out the design principles that should be adopted to ensure that packaging can be integrated into recycling streams.

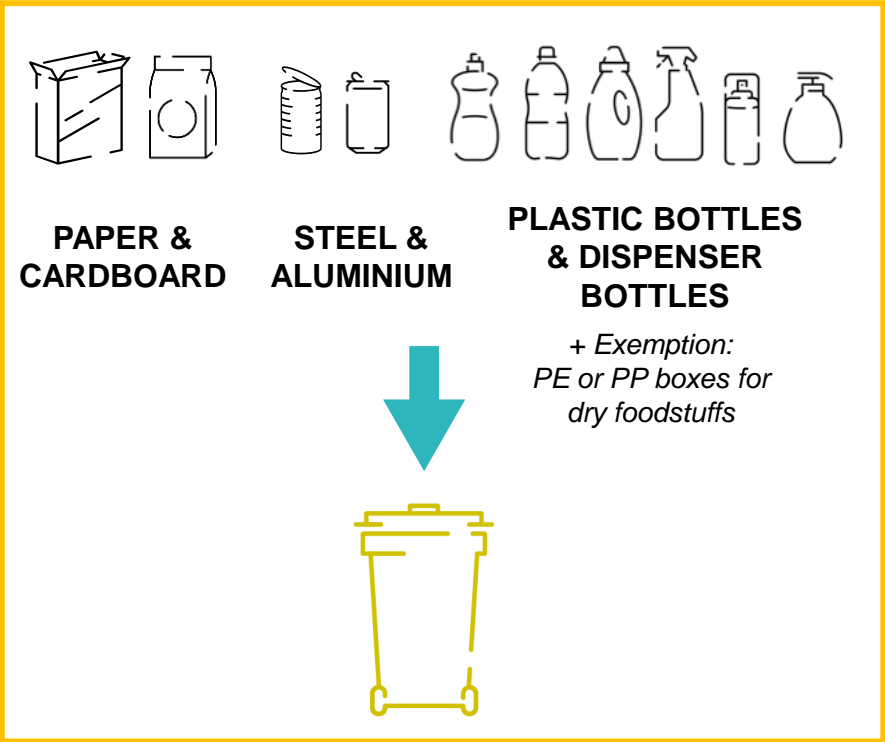
These recommendations are based on the **current operating conditions for collection, sorting and recycling** in France, where **sorting and recycling streams for plastics are being stabilised or developed**. The recommendations may therefore change depending on progress made with recycling at the end of the roll-out period for the extended sorting instructions.

Some of the solutions presented are already recycled in France, but not necessarily all of them (for example if they are not sorted at all French sorting centres or if there is no recycling stream).

Context – Sorting instructions extension in full swing

Previously in France, the **sorting instructions** for plastic packaging were restricted to **bottles and dispenser bottles**.

**HISTORICAL
NATIONAL
INSTRUCTIONS**



ALL OTHER PACKAGING
Pots, trays, boxes, film, bags, etc.

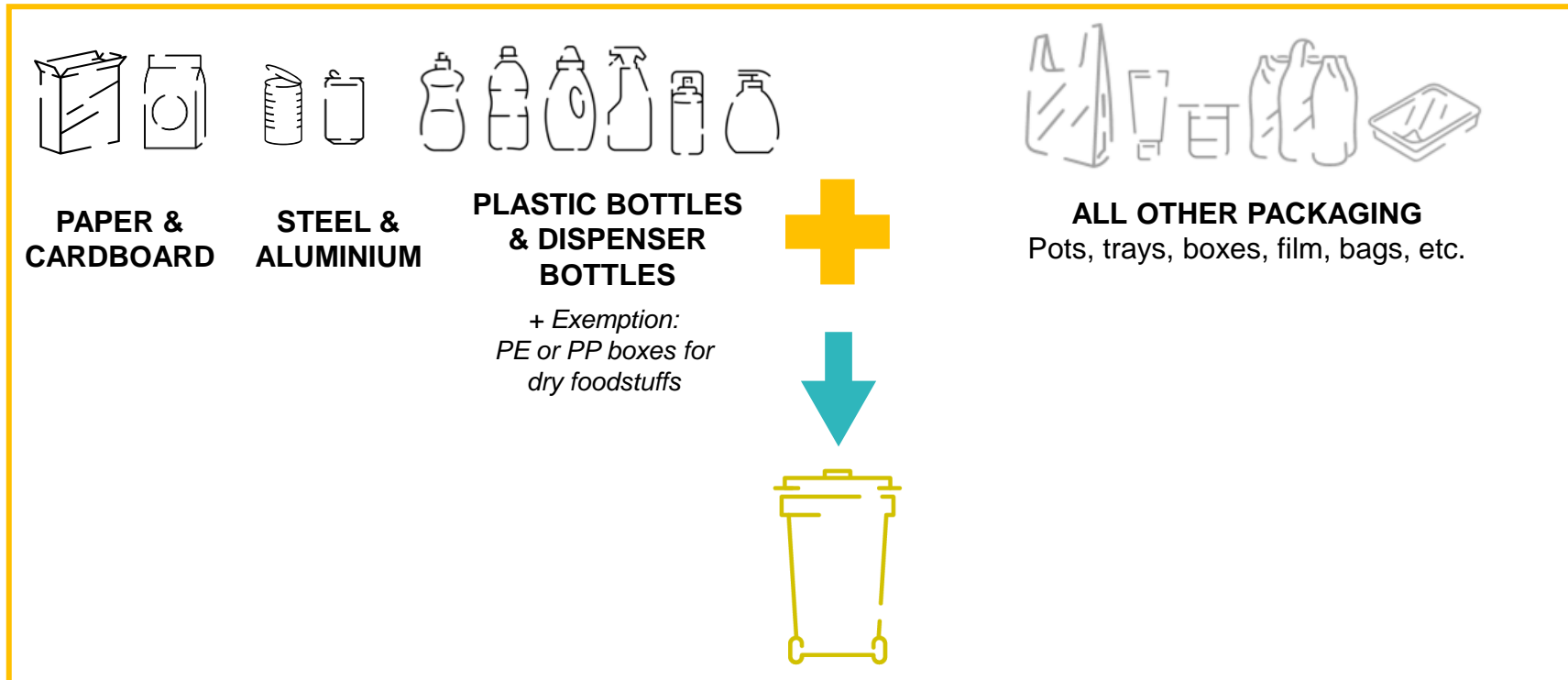


Context – Sorting instructions extension in full swing

In 2011, Citeo and its partners launched a project to **extend the sorting instructions** to all plastic packaging.

Simplifying the sorting process involves extending the sorting instructions so that people can **dispose of all types of packaging in the sorting bin** and developing the recycling of plastic packaging items that were previously not recycled, e.g. film, pots and trays, etc.

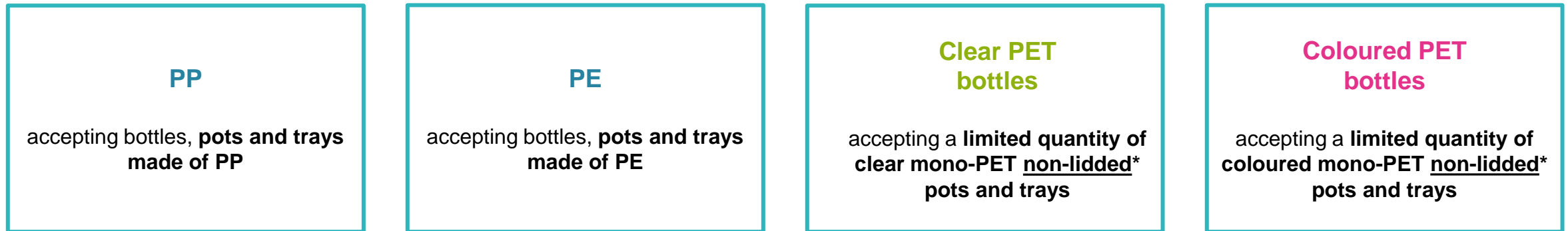
EXTENSION OF SORTING INSTRUCTIONS



Progress is being made in the extension of sorting instructions in France. **By late 2020, almost 50%** of French people were able to sort all of their packaging and **this will apply to 100% of French people** in the next few years.

Context – The recycling streams

- 1 With progress being made in the extension of sorting instructions, the tonnage of pots and trays **disposed of in sorting bins** is on the rise.
- 2 The packaging waste is then collected and taken to a **sorting centre** that separates the recyclable packaging from the “sorting rejects”. The recyclable items are separated according to material and sent to the existing recycling streams.
- 3 In 2021, the **existing recycling streams in France** for **rigid plastics** are:



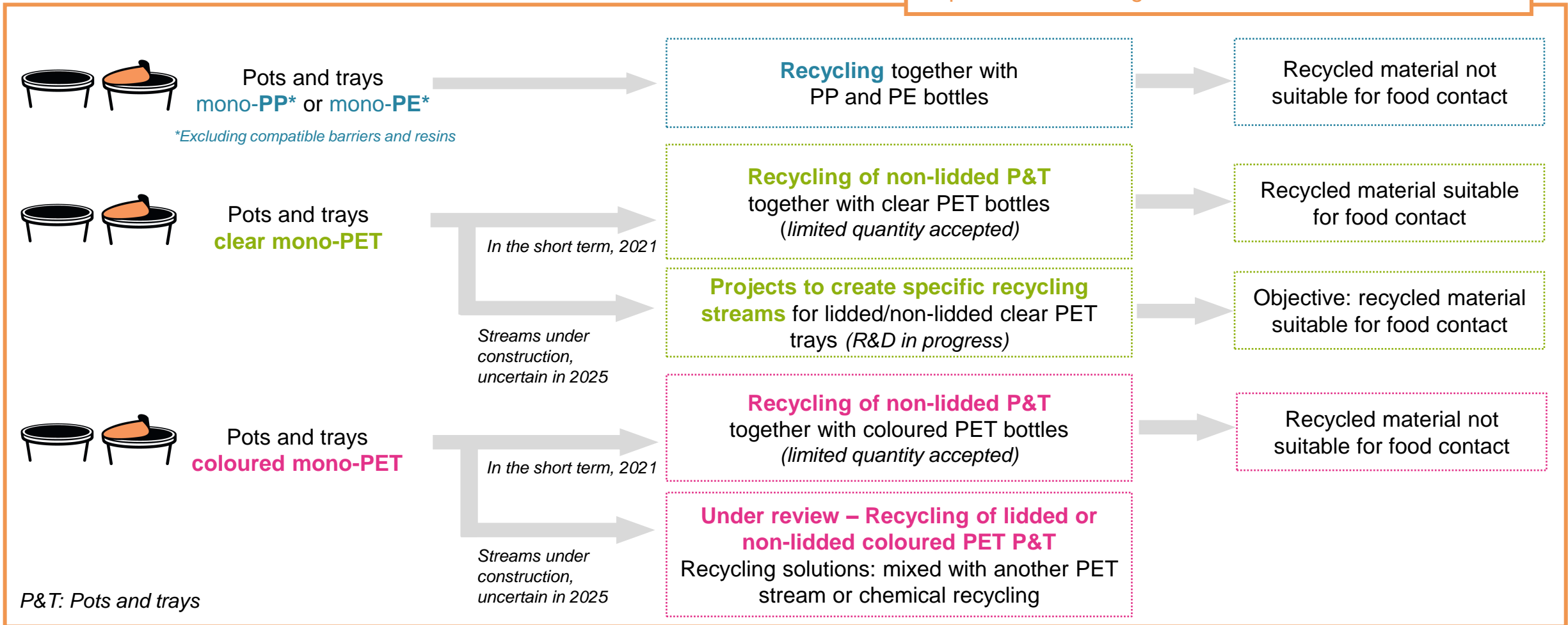
*It will only be possible to integrate **lidded PET pots and trays (i.e. sealed when they are put on the market)** into the recycling streams if they **are well designed** and once the **designated streams have been set up**. The eco-design recommendations given in this guide reflect the best knowledge to date on these potential future streams.


Note

In 2021, various projects are under way to **consolidate the recycling streams for PS**, as recycling facilities and current outlets need to be improved ([see Focus on PS](#)).

Context – The recycling streams

Today, in the extension areas, i.e. the areas where pots and trays can already be disposed of in sorting bins



 In future, it will only be possible to integrate **lidded PET pots and trays (i.e. sealed when they are put on the market)** into the recycling streams if they **are well designed** and once the **designated streams have been set up**.

Three eco-design rules to follow to make a pot or tray easier to recycle

1. Priority for recycling should be given to the heaviest element of the packaging, i.e. the tray or pot body


As such, the body must be **mono-material, mono-resin*** and made of a resin which is allocated to a recycling stream**:
rigid PP, PE, PET or PS.

2. Barriers, colorants, additives and fillers should not compromise sorting and recycling

For example, the pots and trays should not contain dark **colorants** that are undetectable by optical sorting, or **fillers/additives** that alter their density. Compatible functional **barriers** should be used.

3. None of the associated elements should disrupt recycling of the tray or pot body

Design choices for associated elements (covers, lids, absorbent pads, labels, etc.) should be based on the resin used in the body.

 Some of the **associated elements**, such as labels, lids and absorbent pads, are not intended to be recycled together with the pot or tray. The aim is to separate these elements from the pot or tray during the collection, sorting and recycling stages.

Recommendations for a pot or tray:



**Excluding compatible barriers and resins*

***PS and lidded PET: streams under review/development*

Pots and trays with a PP body (1/4)

(based on the latest information available to COTREP in 2021)

[Back to contents](#)

RECOMMENDATIONS

Pot or tray body

Materials and barriers

If possible use: mono-PP

- ✓ EVOH* barrier
- ✓ Carbon black as an internal layer
- ✓ Kapseal[®]
- ✓ PP associated with PE*
- ✗ Other material/resin/barrier (multi-layer, blend)

Colorants

If possible use: colourless

- ✗ Dark colorants undetectable by optical sorting
- ✓ All other translucent and opaque colours

Additives (gases, fillers, agents) and density

- ✓ Surface silicone for unstacking
- ✓ Expanded PP (gases, blowing agents) with density < 1 – [Not assessed](#)
- ✗ Mineral-filled PP (fillers and other agents) with density > 1
- ✗ PP mineral-filled then expanded

Inks and designs on PP body

If possible use: laser marking

- ✓ Direct printing with ink not washable at room temperature
- ✗ Direct printing with washable or metallic ink
- ✓ IML PP
- ✓ IML PE
- ✗ IML with plastic resin made of a material other than PP or PE



1

**Quantities of EVOH and PE should be limited as much as possible, i.e. use the minimum quantity to ensure that the packaging is functional. To date, the impact of tie layers between PP (or PE) and EVOH has not been studied and does not seem to be an obstacle.*

Key

✓ Compatible ✓ Compatible but to be avoided ✗ Non-compatible and/or disruptive

For further details

Dark colorants

Fillers and density

Designs

Pots and trays with a PP body (2/4)

(based on the latest information available to COTREP in 2021)

[Back to contents](#)

RECOMMENDATIONS

Choice of closure systems *if necessary:*



Non-sealed/bonded cover ⁽¹⁾

If possible use: PP

- ✓ PE
- ✓ Plastic with density > 1
- ✓ Metal
- ✗ Wood
- ✗ Other plastic with density < 1
- ✗ Thermoset plastics



Mono- or multi-material lid with density > 1 ⁽²⁾

- ✓ Peelable and/or adhesive that is released during washing
- ✗ Non-peelable and adhesive that is not released during washing



Lid with density < 1 combining only PP, PE, EVOH, surlyn and/or SiOx, AlOx, COx coating

- ✓ Peelable and/or adhesive that is released during washing
- ✓ Non-peelable and adhesive that is not released during washing



Aluminium lid

- ✓ Peelable and/or adhesive that is released during washing
- ✗ Non-peelable and adhesive that is not released during washing



Other mono- or multi-material lid with density < 1 ⁽²⁾

- ✗ Peelable and/or adhesive that is released during washing
- ✗ Non-peelable and adhesive that is not released during washing

Designs/inks on the closure system

- ✓ Ink not washable ⁽³⁾ at room temperature
- ✗ Ink washable at room temperature
- ✗ Metallic ink

For further information

Assembly

via heat sealing

- Preferably apply a sealing layer of PP or PE
- Preferably apply a sealing layer that remains mainly on the lid

via bonding

- Preferably use an adhesive that is released during washing and/or remains mainly on the lid

Key

- ✓ Compatible
- ✓ Compatible but to be avoided
- ✗ Non-compatible and/or disruptive

⁽¹⁾ Analysis based on the principle that a cover is not separated from the pot.

⁽²⁾ Examples: lid with several plastic resins, plastic/paper, plastic with a thin layer of aluminium.

⁽³⁾ Examples: sandwich printing or surface printing with varnish.

Pots and trays with a PP body (3/4)

(based on the latest information available to COTREP in 2021)

[Back to contents](#)

RECOMMENDATIONS

Label affixed to the body or cover *if necessary*

Label materials

If possible, use: PP, OPP, PE with adhesive that is released during washing*

- ✓ Paper with a water releasable adhesive*
- ✓ Paper wrapping with a line of not water releasable adhesive*
- ✓ PP, OPP with a not water releasable adhesive*
- ✓ Plastic $d > 1$ (ex. PET, PETg, PS) with a water releasable adhesive*
- ✓ PSL Paper with a not water releasable adhesive*
- ✓ PE with a not water releasable adhesive*
- ✗ PVC
- ✗ Other plastics $d < 1$
- ✗ Other plastics $d > 1$ with a not water releasable adhesive*
- ✗ Complex with aluminium layer (e.g. PP/Al)

Other

- ✓ IML PP
- ✗ IML with plastic resin made of a material other than PP or PE
- ✓ IML PE
- ✗ RFID chip

Adhesive

- ✓ Released during washing* without leaving residue on the packaging
- ✗ Not released during washing*

Designs/inks on labels

- ✓ Non-washable ink*
- ✗ Washable ink*
- ✗ Metallic ink

Size of the labels

- **Restrict the coverage and size of associated elements** to maximise the chances of the pot or tray being detected at sorting centres



Please note: the labels (element associated with the packaging body) are not intended to be recycled, but they should not disrupt recycling of the pot or tray body. The aim is to separate them from the pot or tray during the recycling stages.

Key

- ✓ Compatible
- ✓ Compatible but to be avoided
- ✗ Non-compatible and/or disruptive

*Washable at room temperature.

For further details

Other associated element: absorbent pad

3

Pots and trays with a PP body (4/4)

(based on the latest information available to COTREP in 2021)

[Back to contents](#)

RECAP – IDEAL SOLUTIONS

1

Pot or tray body
Mono-PP ($d < 1$)

2

Non-sealed/bonded cover



If possible use: PP
Options: PE or plastic with density > 1

Closure system, if necessary

Lid with density > 1
mono- or multi-material*
peelable and/or with adhesive that is released
during washing



Lid with density < 1
combining only PP, PE, EVOH, surlyn
and/or SiOx, AlOx, COx coating
peelable and/or with adhesive that is released
during washing



For further information – Lid assembly

Heat sealing: PE or PP sealing layer and/or sealing layer that remains mainly on the lid
Bonding: adhesive that is released during washing at room temperature and/or remains mainly on the lid

Designs on closure system, if necessary

Ink not washable at room temperature

3

Label on body or cover, if necessary

PP, OPP, PE with adhesive that is released during washing at room temperature and non-washable ink

Pots and trays with a PE body (1/4)

(based on the latest information available to COTREP in 2021)

[Back to contents](#)

RECOMMENDATIONS

Pot or tray body

Materials and barriers

If possible use: mono-PE

- ✓ EVOH* barrier
- ✓ Carbon black as an internal layer
- ✓ Surlyn[®]
- ✓ PE associated with PP*
- ✗ Other material/resin/barrier (multi-layer, blend)
- ✗ Thermoset plastics

Colorants

If possible use: colourless

- ✗ Dark colorants undetectable by optical sorting
- ✓ All other translucent and opaque colours

Additives (gases, fillers, agents) and density

- ✓ Surface silicone for unstacking
- ✓ Expanded PE (gases, blowing agents) with density < 1 – [Not assessed](#)
- ✗ Mineral-filled PE (fillers and other agents) with density > 1
- ✗ PE mineral-filled then expanded

Inks and designs on PE body

If possible use: laser marking

- ✓ Direct printing with ink not washable at room temperature
- ✗ Direct printing with washable or metallic ink
- ✓ IML PE
- ✓ IML PP
- ✗ IML with plastic resin made of a material other than PE or PP



1

**Quantities of EVOH and PP should be limited as much as possible, i.e. use the minimum quantity to ensure that the packaging is functional. To date, the impact of tie layers between PE (or PP) and EVOH has not been studied and does not seem to be an obstacle.*

Key

✓ Compatible ✓ Compatible but to be avoided ✗ Non-compatible and/or disruptive

For further details

Dark colorants

Fillers and density

Designs

Pots and trays with a PE body (2/4)

(based on the latest information available to COTREP in 2021)

[Back to contents](#)

RECOMMENDATIONS

Choice of closure systems *if necessary:*



Non-sealed/bonded cover ⁽¹⁾

If possible use: PE

- ✓ PP
- ✓ Plastic with density > 1
- ✓ Metal
- ✗ Wood
- ✗ Other plastic with density < 1
- ✗ Thermoset plastics



Mono- or multi-material lid with density > 1 ⁽²⁾

- ✓ Peelable and/or adhesive that is released during washing
- ✗ Non-peelable and adhesive that is not released during washing



Lid with density <1 combining only PE, PP, EVOH, surlyn and/or SiOx, AlOx, COx coating

- ✓ Peelable and/or adhesive that is released during washing
- ✓ Non-peelable and adhesive that is not released during washing



Aluminium lid

- ✓ Peelable and/or adhesive that is released during washing
- ✗ Non-peelable and adhesive that is not released during washing



Other mono- or multi-material lid with density < 1 ⁽²⁾

- ✗ Peelable and/or adhesive that is released during washing
- ✗ Non-peelable and adhesive that is not released during washing

Designs/inks on the closure system

- ✓ Ink not washable ⁽³⁾ at room temperature
- ✗ Ink washable at room temperature
- ✗ Metallic ink

For further information

Assembly

via heat sealing

- Preferably apply a sealing layer of PP or PE
- Preferably apply a sealing layer that remains mainly on the lid

via bonding

- Preferably use an adhesive that is released during washing and/or remains mainly on the lid

Key

- ✓ Compatible
- ✓ Compatible but to be avoided
- ✗ Non-compatible and/or disruptive

⁽¹⁾ Analysis based on the principle that a cover is not separated from the pot.

⁽²⁾ Examples: lid with several plastic resins, plastic/paper, plastic with a thin layer of aluminium.

⁽³⁾ Examples: sandwich printing or surface printing with varnish.

Pots and trays with a PE body (3/4)

(based on the latest information available to COTREP in 2021)

[Back to contents](#)

RECOMMENDATIONS

Label affixed to the body or cover *if necessary*

Label materials

If possible, use: PP, OPP, PE with adhesive that is released during washing*

- ✓ Paper with a water releasable adhesive*
- ✓ Paper wrapping with a line of not water releasable adhesive*
- ✓ PE with a not water releasable adhesive*
- ✓ Plastic $d > 1$ (ex. PET, PETg, PS) with a water releasable adhesive*
- ✓ PSL Paper with a not water releasable adhesive*
- ✓ PP, OPP with a not water releasable adhesive*
- ✗ PVC
- ✗ Other plastics $d < 1$
- ✗ Other plastics $d > 1$ with a not water releasable adhesive*
- ✗ Complex with aluminium layer (e.g. PP/Al)

Other

- ✓ IML PE
- ✗ IML with plastic resin made of a material other than PE or PP
- ✓ IML PP
- ✗ RFID chip

Adhesive

- ✓ Released during washing* without leaving residue on the packaging
- ✗ Not released during washing*

Designs/inks on labels

- ✓ Non-washable ink*
- ✗ Washable ink*
- ✗ Metallic ink

Size of the labels

- **Restrict the coverage and size of associated elements** to maximise the chances of the pot or tray being detected at sorting centres



Please note: the labels (element associated with the packaging body) are not intended to be recycled, but they should not disrupt recycling of the pot or tray body. The aim is to separate them from the pot or tray during the recycling stages.

Key

✓ Compatible ✓ Compatible but to be avoided ✗ Non-compatible and/or disruptive

*Washable at room temperature.

For further details

Other associated element: absorbent pad

3

Pots and trays with a PE body (4/4)

(based on the latest information available to COTREP in 2021)

[Back to contents](#)

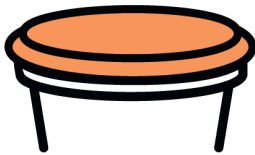
RECAP – IDEAL SOLUTIONS

1

Pot or tray body
Mono-PE ($d < 1$)

2

Non-sealed/bonded cover



If possible use: PE
Options: PP or plastic with density > 1

Closure system, if necessary

Lid with density > 1
mono- or multi-material*
peelable and/or with adhesive that is released
during washing



Lid with density < 1
combining only PP, PE, EVOH, surlyn
and/or SiOx, AlOx, COx coating
peelable and/or with adhesive that is released
during washing



For further information – Lid assembly

Heat sealing: PE or PP sealing layer and/or sealing layer that remains mainly on the lid
Bonding: adhesive that is released during washing at room temperature and/or remains mainly on the lid

Designs on closure system, if necessary

Ink not washable at room temperature

3

Label on body or cover, if necessary

PP, OPP, PE with adhesive that is released during washing at room temperature and non-washable ink

Pots and trays with a clear PET body (1/4)

(based on the latest information available to COTREP in 2021)

[Back to contents](#)

RECOMMENDATIONS

Pot or tray body

Materials and barriers

- ✓ **Mono-PET or APET**
- ✗ Multi-layer (e.g. PET/PE)
- ✗ Copolyester (e.g. PETG, PET-GAG, hot-fill PET)
- ✗ EVOH barrier
- ✗ PA barrier
- ✗ Other material/resin/barrier (multi-layer, blend)

Colorants

- ✓ Transparent colourless
- ✓ Transparent light blue
- Other colours – [see coloured PET sheet](#)

Additives (gases, fillers, agents) and density

- ✓ Surface silicone for unstacking
- ✗ PET with density < 1
- Expanded or mineral-filled PET – [see coloured PET sheet](#)

Inks and designs on clear PET body

Preferably: no printing or laser marking

- ✗ Direct printing

NB: marking the expiry date is tolerated.



1

Key

✓ *Compatible* ✓ *Compatible but to be avoided* ✗ *Non-compatible and/or disruptive*

For further details

Fillers and density

Designs

Please note

It will only be possible to integrate **lidded clear PET pots and trays (i.e. sealed when they are put on the market)** into the recycling streams if they **are well designed** and once the **designated streams have been set up.**

Pots and trays with a clear PET body (2/4)

(based on the latest information available to COTREP in 2021)

[Back to contents](#)

RECOMMENDATIONS

Choice of closure systems *if necessary:*



Non-sealed/bonded cover ⁽¹⁾

If possible use: **non-printed transparent PET or PP or PE**

- ✓ Other plastic with density < 1
- ✗ Other plastic with density > 1
- ✗ Printed transparent PET
- ✗ Wood
- ✗ Thermoset plastics
- ✗ Metal



Mono- or multi-material lid with density $d < 1$ ⁽²⁾, without metal

- ✓ Peelable and/or adhesive that is released during washing
- ✗ Non-peelable and adhesive that is not released during washing



Non-printed transparent PET lid

- ✓ Peelable and/or adhesive that is released during washing ⁽⁵⁾
- ✗ Non-peelable and adhesive that is not released during washing

Non-compatible closure systems

- ✗ Lid with density < 1 with metal (aluminium layer, metallisation)
- ✗ Mono- or multi-material lid of density > 1 (excl. non-printed transparent PET)
- ✗ Aluminium lid

Designs/inks on the closure system

- ✓ Ink not washable ⁽³⁾ at 60-80°C ⁽⁴⁾ in alkaline conditions (with soda)
- ✗ Ink washable at 60-80°C ⁽⁴⁾ in alkaline conditions (with soda)
- ✗ Metallic ink

For further information

Assembly via heat sealing

Preferably apply a sealing layer ⁽⁵⁾ that remains mainly on the lid

Assembly via bonding

Preferably use an adhesive that is released during washing and/or remains mainly on the lid

Please note

It will only be possible to integrate **lidded clear PET pots and trays (i.e. sealed when they are put on the market)** into the recycling streams if they **are well designed** and once the **designated streams have been set up**. The recommendations reflect the best knowledge to date on these potential future streams.

⁽¹⁾ Analysis based on the principle that a cover is not separated from the pot. Studies could be carried out to assess the sorting potential.

⁽²⁾ Examples: lid with several plastic resins, plastic/paper.

⁽³⁾ Examples: sandwich printing or surface printing with varnish.

⁽⁴⁾ Please note: 80°C is the average temperature of the washers used to recycle PET bottles. This temperature may be different for future tray lines.

⁽⁵⁾ Additional studies should be conducted on the sealing agents and their potential impact on the quality of rPET, particularly for food contact.

Key

✓ Compatible ✓ Compatible but to be avoided ✗ Non-compatible and/or disruptive

Pots and trays with a clear PET body (3/4)

(based on the latest information available to COTREP in 2021)

[Back to contents](#)

RECOMMENDATIONS

Label affixed to the body or cover *if necessary*

Label materials

If possible use: plastic with density < 1 (e.g. PP, OPP, PE) with adhesive that is released during washing*

- ✓ Paper with adhesive that is released during washing*
- ✗ PET
- ✗ Other plastic with density > 1 (e.g. PVC, PETg, PS)
- ✗ Complex with aluminium layer (e.g. PP/AL)

Adhesive

- ✓ Released during washing* without leaving residue on the packaging
- ✗ Not released during washing*

Designs/inks on labels

- ✓ Non-washable ink*
- ✗ Washable ink*
- ✗ Metallic ink

Size of the labels

→ **Restrict the coverage and size of associated elements** to maximise the chances of the pot or tray being detected at sorting centres

Other

- ✗ RFID chip



Please note: the labels (element associated with the packaging body) are not intended to be recycled, but they should not disrupt recycling of the pot or tray body. The aim is to separate them from the pot or tray during the recycling stages.

Key

✓ Compatible ✓ Compatible but to be avoided ✗ Non-compatible and/or disruptive

For further details

Other associated element: absorbent pad

*Washable at 60-80°C in alkaline conditions (with soda).

Please note: 80°C is the average temperature of the washers used to recycle PET bottles. This temperature may be different for future tray lines.

Pots and trays with a clear PET body (4/4)

(based on the latest information available to COTREP in 2021)

[Back to contents](#)

RECAP – IDEAL SOLUTIONS

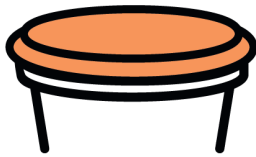
1

Pot or tray body

Mono-PET or APET, transparent light blue or colourless, no printing

2

Non-sealed/bonded cover



If possible use: Non-printed transparent PET or PP or PE

Option: other plastic with density < 1

Closure system, if necessary

Lid with density < 1 mono- or multi-material ⁽¹⁾, without metal peelable and/or with adhesive that is released during washing



Non-printed transparent PET lid peelable and/or with adhesive that is released during washing



Please note: it will only be possible to integrate **lidded clear PET pots and trays** (i.e. sealed when they are put on the market) into the recycling streams if they **are well designed** and once the **designated streams have been set up**.

For further information – Lid assembly

Heat sealing: sealing layer that remains mainly on the lid

Bonding: adhesive that is released during washing at 60-80°C ⁽²⁾ in alkaline conditions and/or remains mainly on the lid

Designs on closure system, if necessary

Ink not washable at 60-80°C ⁽²⁾ in alkaline conditions

3

Label on body or cover, if necessary

Plastic with density < 1 (e.g. PP, OPP, PE) with adhesive that is released during washing and non-washable ink

⁽¹⁾ Examples: lid with several plastic resins, plastic/paper.

⁽²⁾ Please note: 80°C is the average temperature of the washers used to recycle PET bottles. This temperature may be different for future tray lines.

Pots and trays with a coloured PET body (1/4)

(based on the latest information available to COTREP in 2021)

[Back to contents](#)

RECOMMENDATIONS

Pot or tray body

Materials and barriers

- ✓ **Mono-PET or APET**
- ✗ Multi-layer (e.g. PET/PE)
- ✗ Copolyester (e.g. PETG, PET-GAG, hot-fill PET)
- ✗ EVOH barrier
- ✗ PA barrier
- ✗ Other material/resin/barrier (multi-layer, blend)

Colorants

**If possible use: transparent colourless, [see clear PET sheet](#)
blue, green**

- ✗ Dark colorants undetectable by optical sorting
- ✗ Metallic or fluorescent colours
- ✓ Any other colour except blue or green
- ✓ Any other colour with > 1% mineral content

Additives (gases, fillers, agents) and density

- ✓ Surface silicone for unstacking
- ✓ Expanded PET (gases, blowing agents) with density > 1 – [Not assessed](#)
- ✗ Expanded PET (gases, blowing agents) with density < 1
- ✗ PET mineral-filled then expanded
- ✓ Opaque PET > 1% mineral content

Inks and designs on coloured PET body

Preferably: no printing or laser marking

- ✓ Direct printing with ink not washable at 60-80°C, on PET packaging other than green or opaque white
- ✗ Direct printing with ink washable at 60-80°C
- ✗ Direct printing on green or opaque white PET packaging
- ✗ Metallic ink



1

Key

✓ Compatible ✓ Compatible but to be avoided ✗ Non-compatible and/or disruptive

For further details

Dark colorants

Fillers and density

CPET

Designs

Please note

It will only be possible to integrate **lidded coloured PET pots and trays (i.e. sealed when they are put on the market)** into the recycling streams if they **are well designed** and if the **designated streams have been set up**.

Pots and trays with a coloured PET body (2/4)

(based on the latest information available to COTREP in 2021)

[Back to contents](#)

RECOMMENDATIONS

Choice of closure systems *if necessary:*



Non-sealed/bonded cover ⁽¹⁾

If possible use: **non-printed transparent or blue/green PET or PP or PE**

- ✓ Other plastic with density < 1
- ✓ Printed PET
- ✓ PET other colours
- ✓ PET with >1% mineral content
- ✗ Other plastics with density > 1
- ✗ Wood
- ✗ Thermoset plastics
- ✗ Metal



Mono- or multi-material lid with density $d < 1$ ⁽²⁾, without metal

- ✓ Peelable and/or adhesive that is released during washing
- ✗ Non-peelable and adhesive that is not released during washing



Printed or non-printed PET lid

- ✓ Peelable and/or adhesive that is released during washing ⁽⁵⁾
- ✗ Non-peelable and adhesive that is not released during washing

Non-compatible closure systems

- ✗ Lid with density < 1 with metal (aluminium layer, metallisation)
- ✗ Mono- or multi-material lid with density > 1 (excl. PET, *see conditions above*)
- ✗ Aluminium lid

Key

✓ Compatible ✓ Compatible but to be avoided ✗ Non-compatible and/or disruptive

Designs/inks on the closure system

- ✓ Ink not washable ⁽³⁾ at 60-80°C ⁽⁴⁾ in alkaline conditions (with soda)
- ✗ Ink washable at 60-80°C ⁽⁴⁾ in alkaline conditions (with soda)
- ✗ Metallic ink

For further information

Assembly via heat sealing

Preferably apply a sealing layer ⁽⁵⁾ that remains mainly on the lid

Assembly via bonding

Preferably use an adhesive that is released during washing and/or remains mainly on the lid

Please note

It will only be possible to integrate **lidded coloured PET pots and trays (i.e. sealed when they are put on the market)** into the recycling streams if they **are well designed** and if the **designated streams have been set up**. The recommendations reflect the best knowledge to date on these potential future streams.

⁽¹⁾ Analysis based on the principle that a cover is not separated from the pot. Studies could be carried out to assess the sorting potential.

⁽²⁾ Examples: lid with several plastic resins, plastic/paper.

⁽³⁾ Examples: sandwich printing or surface printing with varnish.

⁽⁴⁾ Please note: 80°C is the average temperature of the washers used to recycle PET bottles. This temperature may be different depending on the end of life chosen for coloured PET trays.

⁽⁵⁾ Additional studies should be conducted on the sealing agents and their potential impact on the quality of rPET.

Pots and trays with a coloured PET body (3/4)

(based on the latest information available to COTREP in 2021)

[Back to contents](#)

RECOMMENDATIONS

Label affixed to the body or cover *if necessary*

Label materials

If possible use: plastic with density < 1 (e.g. PP, OPP, PE) with adhesive that is released during washing*

- ✓ Paper with adhesive that is released during washing*
- ✓ PET on PET packaging other than green or opaque white, with adhesive that is released during washing*
- ✗ PET on green or opaque white PET packaging
- ✗ Other plastic with density > 1 (e.g. PVC, PETg, PS)
- ✗ Complex with aluminium layer (e.g. PP/AL)

Adhesive

- ✓ Released during washing* without leaving residue on the packaging
- ✗ Not released during washing*

Designs/inks on labels

- ✓ Non-washable ink*
- ✗ Washable ink*
- ✗ Metallic ink

Size of the labels

- **Restrict the coverage and size of associated elements** to maximise the chances of the pot or tray being detected at sorting centres

Other

- ✗ RFID chip



Please note: the labels (element associated with the packaging body) are not intended to be recycled, but they should not disrupt recycling of the pot or tray body. The aim is to separate them from the pot or tray during the recycling stages.

Key

✓ Compatible ✓ Compatible but to be avoided ✗ Non-compatible and/or disruptive

For further details

Other associated element: absorbent pad

*Washable at 60-80°C in alkaline conditions (with soda).

Please note: 80°C is the average temperature of the washers used to recycle PET bottles. This temperature may be different depending on the end of life chosen for coloured PET trays.

Pots and trays with a coloured PET body (4/4)

(based on the latest information available to COTREP in 2021)

[Back to contents](#)

RECAP – IDEAL SOLUTIONS

Pot or tray body

1

Mono-PET or APET, transparent light blue or colourless, no printing ([see clear PET sheet](#)).
Otherwise, blue or green with < 1% mineral content, no printing

2

Non-sealed/bonded cover



If possible use:

Non-printed transparent or blue/green PET or PP or PE

Options: other plastic with density < 1
or PET (other colours and/or printed)

Closure system, if necessary

Lid with density < 1

mono- or multi-material ⁽¹⁾, without metal
peelable and/or with adhesive that is released
durina washing



Please note: it will only be possible to integrate **lidded coloured PET pots and trays** (i.e. sealed when they are put on the market) into the recycling streams if they **are well designed** and if the **designated streams have been set up**.

For further information – Lid assembly

Heat sealing: sealing layer that remains mainly on the lid

Bonding: adhesive that is released during washing at 60-80°C ⁽²⁾ in alkaline conditions and/or remains mainly on the lid



Printed or non-printed PET lid
peelable and/or with adhesive that is
released during washing

Designs on closure system, if necessary

Ink not washable at 60-80°C ⁽²⁾ in alkaline conditions

3

Label on body or cover, if necessary

Plastic with density < 1 (e.g. PP, OPP, PE) with adhesive that is released during washing and non-washable ink

⁽¹⁾ Examples: lid with several plastic resins, plastic/paper.

⁽²⁾ Please note: 80°C is the average temperature of the washers used to recycle PET bottles. This temperature may be different depending on the end of life chosen for coloured PET trays.

Pots and trays with a PS body

(based on the latest information available to COTREP in 2021)

[Back to contents](#)

PS pots and trays with a density > 1 that are sorted under the extension of the sorting instructions are recycled.

In 2021, **work is in progress** to consolidate the recycling streams for PS, XPS and EPS because regeneration plants and **current outlets need to be improved**.

Under review



Study in progress to create a recycling stream

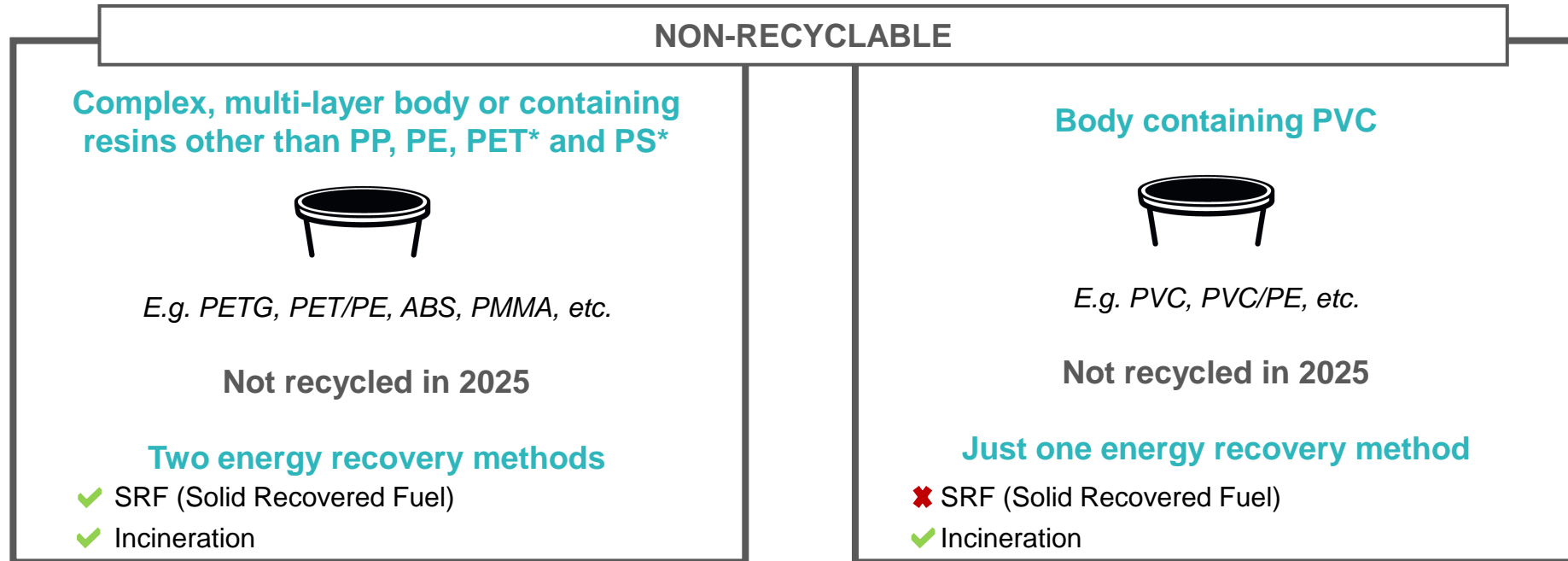
The **key principles** of eco-design mentioned earlier remain applicable:

- Priority should be given to recycling the heaviest packaging element.
- Barriers, additives, fillers and associated elements should not compromise sorting and recycling of the body.

Pots and trays with a body made of PVC, PETG, PET/PE, etc.

(based on the latest information available to COTREP in 2021)

[Back to contents](#)



Recommendation

Substitute with a PP, PE, PET* or PS* resin

** PS and lidded PET: streams under review/development*

Can other recycling streams be envisaged?

PEF, PHA, etc. Emergent new resins monitored and options explored to create a recycling stream for these resins if the volumes marketed become significant and the recycled materials obtained have outlets with added value (need for technical and economic studies).



Focus on dark colorants

(based on the latest information available to COTREP in 2021)

[Back to contents](#)



Explanation

The use of certain **colorant solutions** in dark, rigid plastic packaging, e.g. certain solutions containing carbon black, **can render dark packaging items undetectable by optical sorting** at sorting centres. These pigments absorb infrared radiation, which means that the packaging returns no signal and therefore cannot be identified at sorting centres and directed towards a recycling stream.



Colours considered as light. Detection possible with current knowledge.

Colours considered as dark. Detection unlikely or highly unlikely.

For further information

Further information is available at:

<https://www.citeo.com/le-mag/emballages-sombres-en-plastique-comment-les-rendre-detectables-en-centre-de-tri-pour-mieux/>

- A **standard testing method** for validating the detectability of your colorant solutions and/or dark packaging items
- **Tried-and-tested solutions** available



Focus on changes in density

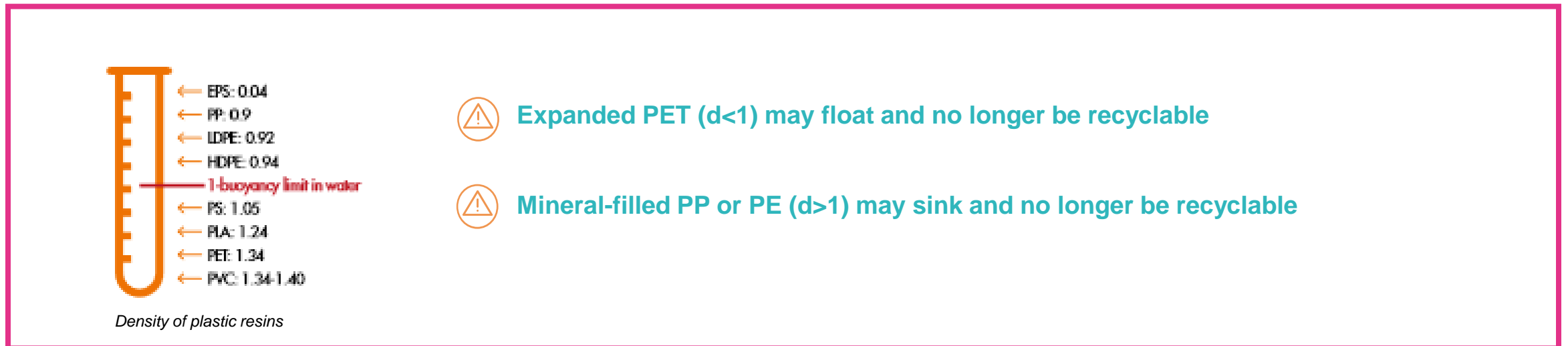
(based on the latest information available to COTREP in 2021)

[Back to contents](#)

All operators recycling plastic packaging in Europe sort waste by density on their regeneration lines to purify the material to be recycled:

- The density of PET pot and tray bodies is naturally higher than 1
- The density of PP and PE pot and tray bodies is naturally lower than 1

The use of gases, blowing agents and fillers may alter the density of the pot or tray above or below 1 and compromise recycling:



Even if the density does not go above or below 1, the presence of gases, blowing agents and fillers in the plastic could also have an impact on regeneration behaviour and/or on the mechanical and rheological properties of the recycled material. This impact on the properties of the recycled material has not been evaluated by COTREP to date.



Focus on the impact of absorbent pads

(based on the latest information available to COTREP in 2021)

[Back to contents](#)

To date, **COTREP has not studied** the behaviour of absorbent pads during the sorting and recycling stages.

Absorbent pads are associated elements and in theory are not intended to be recycled. Given the current mechanical recycling processes, the **theoretical recommendations** below have been formulated to prevent absorbent pads **from disrupting the recycling of the packaging body**.

THEORETICAL RECOMMENDATIONS*

→ **Restrict the size of the absorbent pads** to maximise the chances of the pot or tray being detected at a sorting centre

Absorbent pad on PP or PE tray *if necessary*

Materials

✓ Absorbent pad that sinks to enable separation via flotation

Assembly

Preferably: no adhesive, no sealing

Other options:

- ✓ Adhesive released during washing at room t° w/o leaving residue
- ✗ Adhesive that is not released during washing
- ✗ Sealing

Absorbent pad on PET tray *if necessary*

Materials

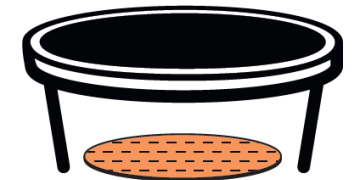
✓ Absorbent pad that floats to enable separation via flotation

Assembly

Preferably: no adhesive, no sealing

Other options:

- ✓ Adhesive released during washing at 60-80°C** in alkaline conditions w/o residue
- ✗ Adhesive that is not released during washing
- ✗ Sealing



*Under the extension of the sorting instructions and the introduction of specific recycling streams for PET pots and trays, studies should be carried out on absorbent pads to consolidate these recommendations.

**80°C is the average temperature of the washers used to recycle PET bottles. This temperature may be different for future tray lines.



Focus on CPET – under review

(based on the latest information available to COTREP in 2021)

[Back to contents](#)



Explanation

CPET is a PET that is crystallised to make it **temperature resistant** (for use in microwaves and ovens). The process of crystallisation can be performed by adding a **mineral catalyst** to the APET. As CPET combines PET and minerals, it falls in the category of **opaque PET**.

CPET is **being examined** by COTREP.

Recommendations

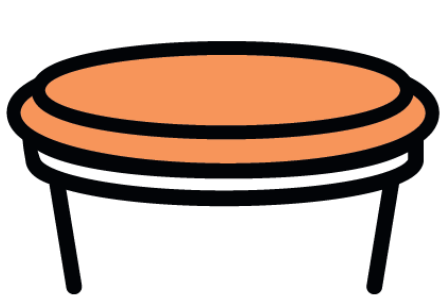
- Only use CPET if the pot or tray needs to be **resistant to high temperatures** (i.e. heated in the oven)
- Limit the **quantity of mineral fillers** used in CPET (since minerals have an impact on recycling)

NB: these pots and trays are subject to a penalty if the proportion of filler is higher than 4%.

Definitions

- ❑ **Multi-material packaging** is the combination of at least two materials from the following six: plastic, paper/cardboard, cartons, glass, steel, aluminium.
- ❑ **A multi-resin packaging item** is a mono-material plastic packaging item (100% plastic) composed of several plastic resins (e.g. PET/PE trays).
- ❑ **A mono-resin or “mono” packaging item** is a mono-material plastic packaging item (100% plastic) composed of a single plastic resin.

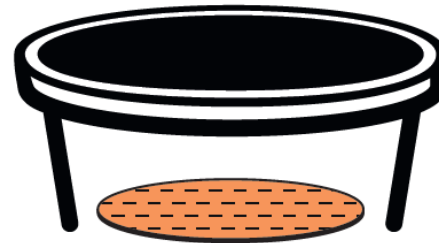
- ❑ **Associated elements** are packaging elements connected to the main element (i.e. the body) and not automatically separated from the main element during consumption of the product and/or sorting by consumers. For pots and trays, the main associated elements are **covers, lids, absorbent pads** and **labels**. Inks and adhesives are associated materials.



Cover



Lid



Absorbent pad



Label

Definitions

❑ **Lid:** refers to the “**flexible top film**” attached to the pot or tray.

NB: the lids available on the market are complex/multi-layer elements. “Mono-PET” lids are also multi-layer (“PET/sealing agent”) made up of several PET grades.

- ❑ A **non-peelable lid** is a lid in which the part sealed to the tray cannot be separated by the consumer. The lid and the tray are joined together too tightly (*i.e. the two parts are melted together*).
- ❑ A **peelable lid** is a lid that, once sealed to the tray, may be removed from it by the consumer (*i.e. the sealed part of the lid can also be detached from the tray*).

There are two types of peelability:

- **Adhesive peelability:** the lid is completely separated from the tray. Nothing remains on the tray, or at the most small residues of sealing agent or adhesive on the tray (*preferred*)
- **Cohesive peelability** or peelability that involves “**breaking the sealing layer**”: the lid is separated from the tray but a layer of the lid remains on the tray



Non-peelable lid



**Peelable lid
Adhesive peelability**



**Peelable lid
Cohesive peelability**

Definitions

❑ **Adhesive** refers to:

- The adhesives used to assemble the associated elements (labels, absorbent pads, etc.)
- The adhesives added to a heat-sealed seam to attach a lid to a preformed tray

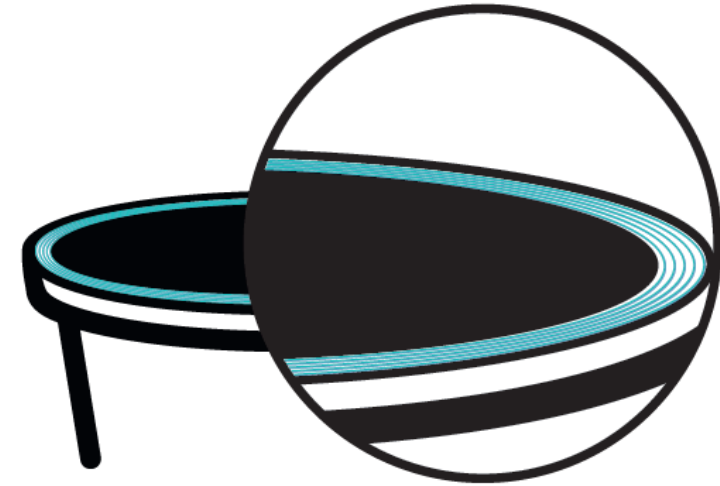
Please note, the word “adhesive” does not refer to:

- **sealing agents** (i.e. the sealing layer) used on some lids to assemble/seal them to the tray.
- The “**tie layer**” between two layers of multi-layer packaging (e.g.: PE/tie layer/EVOH/tie layer/PE)

❑ **Lid assembly**:

There are two types of lid/tray assembly:

- **Bonding**: firstly, an adhesive is added to the edge of the tray, then the lid is sealed to the tray by applying heat.
- **Heat sealing**: no adhesive is added between the tray and the lid. The lid and tray are joined together by applying heat to the **sealing agent** initially present on the lid.



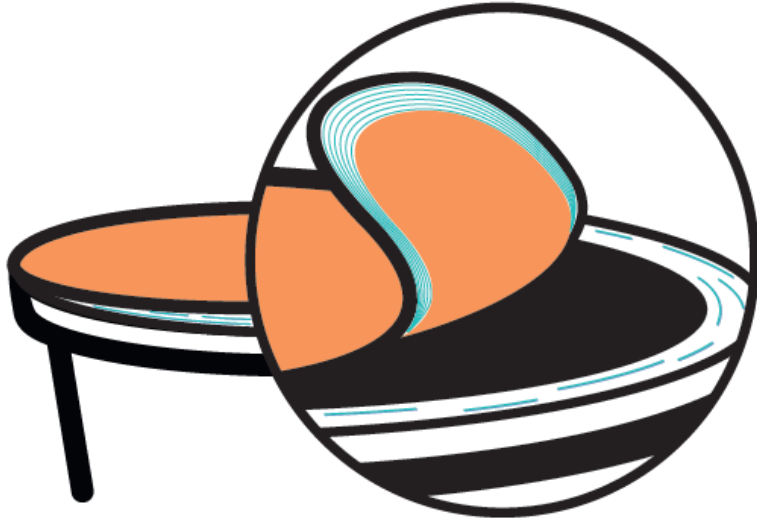
Tray before bonding



Tray before heat sealing

Definitions

- ❑ **“Leaving no residue on the packaging”** means “which leaves as little adhesive/sealing agent residue as possible on the pot or tray”



Adhesive residues
on the tray



Sealing agent residues
on the tray

- ❑ **IML or in-mould labelling:** a pre-printed label that is placed directly into the packaging mould before it is manufactured by injection moulding, blow moulding or thermoforming. The label is an integral part of the packaging after the fusion between the plastic resin and the label. No adhesive is used in this process.