

DEFINING WHAT'S RECYCLABLE AND BEST IN CLASS POLYMER CHOICES FOR PACKAGING

THE UK
PLASTICS
PACT



wrap



CONTENTS

Introduction – Best in class	3
What's recyclable	4
Classifying what's recyclable	5
Polymer choices: Best practice guidance	7
Introduction	7
Milk bottles	8
Bottles (food and drink)	9
Bottles (non-food or drink)	10
Pots, tubs and trays (food and drink)	11
Pots, tubs and trays (non-food or drink)	12
Glossary and resources	13



INTRODUCTION

BEST IN CLASS

This document sets out the vision for best in class polymer choices in rigid plastic packaging used for household goods. It also sets out which plastics used for household packaging are currently considered recyclable.

The primary role of packaging is to protect the product and help eliminate product waste. This is paramount since the carbon impact of the product generally far outweighs that of the packaging itself. However, packaging should be designed in a way that minimises environmental impact, uses the minimum amount of resources possible and designed to be easily recycled. Innovation will be critical to achieving these things.

Lack of material availability is a key barrier to achieving The UK Plastics Pact target of 30% average recycled content across all plastic packaging. Adoption of this guidance will help to overcome this issue by increasing the opportunity for plastic packaging to be recycled and reprocessed back into plastic packaging.

The ambition for recycled content is included in this document and is subject to overcoming a number of technical, practical, social, economic and legislative challenges which will need to be tackled through efforts across the value chain.

Streamlining the polymers used for plastic packaging will help to increase the efficiency and effectiveness of the UK recycling system, while helping to reduce confusion amongst citizens of what can be recycled. Ultimately, the vision is for all plastic packaging to be recyclable and to achieve this it must be collected, sorted, reprocessed and remanufactured – economically and at scale.

The scope of the document is rigid plastic packaging i.e. bottles and pots/tubs/trays. Guidance for film and flexible plastic packaging will be added once finalised.

“
RECYCLING IS A CRITICAL PART OF A CIRCULAR ECONOMY, ENSURING THAT RESOURCES ARE VALUED NOT WASTED, OR LEFT TO POLLUTE OUR NATURAL ENVIRONMENT.
”

The detail in this document is correct at the time of publication and will be updated periodically as and when technology and/or infrastructure advance.

It has been written in consultation with a cross section of UK Plastics Pact members including retailers, manufacturers, waste management companies and reprocessors.

The UK Plastics Pact targets to 2025:

1. Eliminate problematic or unnecessary single-use packaging through redesign, innovation or alternative (reuse) delivery models.
2. 100% of plastic packaging to be reusable, recyclable or compostable.
3. 70% of plastic packaging effectively recycled or composted.
4. 30% average recycled content across all plastic packaging.

WHAT'S RECYCLABLE

Defining 'recyclable' and classifying what household rigid plastic packaging is currently classified as recyclable.

IN ORDER FOR SOMETHING TO BE DEEMED 'RECYCLABLE', IT MUST BE COLLECTED, SORTED, REPROCESSED AND MANUFACTURED BACK INTO A NEW PRODUCT OR PACKAGING – AT SCALE AND ECONOMICALLY.

DEFINING 'RECYCLABLE'

In order for something to be deemed 'recyclable', it must be collected, sorted, reprocessed and manufactured back into a new product or packaging – at scale and economically. The Ellen MacArthur Foundation has developed a useful definition for plastic packaging recycling under the Global Plastics Commitment; this definition is being adopted by The UK Plastics Pact. All plastic packaging under The UK Plastics Pact will need to be compliant with this definition by 2025. An excerpt is included below:

“

A packaging or a packaging component is recyclable if post-consumer collection, sorting, and recycling is proven to work in practise and at scale... A package can be considered recyclable if its main packaging components, together representing more than 95% of the entire packaging weight, are recyclable according to the above definition, and if the remaining minor components are compatible with the recycling process and do not hinder the recyclability of the main components...

”

WHAT'S RECYCLABLE

Using the definition of 'recyclable' as a guide, WRAP consulted with key stakeholders, in particular, UK waste management companies and reprocessors, to identify what is currently classified as recyclable. These classifications will help to measure the target '100% of plastic packaging to be recyclable, reusable or compostable by 2025'. These combined with the best practice guidance in this document provides the direction for businesses to meet this target. The On Pack Recycling Labelling scheme (OPRL) will align with these designations at the next update to their guidelines. Visit [OPRL](#) for more information on the scheme.

These designated polymers will be reviewed on a regular basis (at least annually) to reflect developments in packaging placed on the market, collections, sorting, reprocessing and end markets.

The classifications do not currently include compostable plastic packaging. Separate guidance on the use of these materials will be published. Key applications for these materials are likely to be in flexible packaging, particularly where they can help to increase the collection of food waste.

Plastic packaging is predominantly sorted using near-infra red (NIR) technology. Therefore 'sortable', is defined as plastic packaging that can be detected by NIR.

CLASSIFYING WHAT'S CURRENTLY RECYCLABLE

FOR HOUSEHOLD RIGID PLASTIC PACKAGING

The following table summarises the polymers which are considered recyclable.

Main polymer	Clear/natural	NIR detectable colour	Not NIR detectable
PP	✓	✓	✗
HDPE & LDPE	✓	✓	✗
aPET/rPET	✓	✓	✗
cPET	—	✓	✗
Styrenes (including PS and EPS)	✗	✗	✗
PVC	✗	✗	✗
Multi-layer (incompatible) e.g. PET with PE barrier and metalised layers e.g. toothpaste tubes. Further details on incompatible polymers can be found at: http://www.wrap.org.uk/content/design-tips-making-rigid-plastic-more-recycled	✗	✗	✗

Key

✓ Recyclable — Not applicable ✗ Non-recyclable

WHAT'S RECYCLABLE

ADDITIONAL NON-RECYCLABLE ITEMS

The following exceptions deem a pack as 'Not Recyclable':

- **Any pack containing PVC or PS components.** This is due to the contamination they cause.
- **Tubes from the DIY sector.** This is because of the product that they contain e.g. silicone which contaminates the recycling.
- **Individual packaging items that are smaller than 50 x 50 mm.** Owing to their size they are removed from the recycling in a process designed to remove small contamination. The waste management industry will need to find a solution to recover these items. Meanwhile, designers are encouraged to design packaging in accordance with this document e.g. using recyclable polymers.
- **3D plastic items that are under 0.05mm thick.** Plastic containers that are thinner than 0.05mm will be lost in the process, including during the removal of sleeves.
- **Packaging with metal components.** For example triggers with metal springs. Metal is particularly damaging to recycling equipment.

PET pots/tubs/trays have lower intrinsic viscosity meaning they are more brittle than bottles, resulting in a higher chance of them breaking into fines. The extent of the yield loss is unquantified since at present bottles and trays are often recycled together. Work is needed to improve the recycling of PET trays.



POLYMER CHOICES: BEST PRACTICE GUIDANCE

The best practice guidance on the following pages recommends what are the 'best in class' choices that businesses could make when specifying rigid plastic packaging. Using the 'best in class' material will allow for optimal recyclability and enable more plastic to be recycled back into packaging and displace the need for virgin material.

Further detail on the optimal choices for coatings and components etc. can be found [here](#).



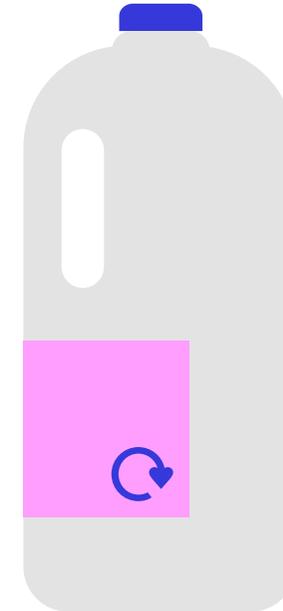
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to navigate
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BEST PRACTICE GUIDANCE MILK BOTTLES

Recycled content ambition – industry target	2019	2022	2025
HDPE	25%	30–35%	45–50%

Further details on coatings and components etc. can be found [here](#).

	Best in class material choice	Best in class colour choice	Why?
Bottle	rHDPE	Natural/uncoloured (not white) Avoid additives and coatings	There is a well-proven existing recycling infrastructure for HDPE milk bottles Using rHDPE for milk bottles will ensure we deliver a circular system for the recycling of this packaging format White is not a preferred colour for HDPE bottles as this can be mistaken for natural (clear) HDPE by the NIR scanners in the recycling centres. This results in the contamination of the clear HDPE material (which impacts the colour of this material)
Cap	HDPE	Minimise colours/tints in caps (i.e. avoid deep colours)	Minimising colour helps to reduce the level of tint that is transferred into the natural colour stream when caps are recycled with the bottles
Label/sleeve	HDPE or PP label (covering less than 40% of the bottle is best practice)	n/a	Labels commonly do not get recycled therefore the smaller the label, the better. Ideally less than 40% and a maximum of 60% in order to ensure the bottle material is correctly identified



On-pack messaging to include:

- Empty
- Flatten
- Cap on
- www.recyclenow.com

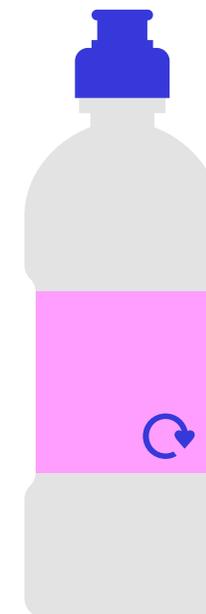
Latest OPRL guidelines available at: www.oprl.org.uk

BEST PRACTICE GUIDANCE BOTTLES (FOOD AND DRINK)

Recycled content ambition – industry target	2019	2022	2025
PET	14–18%	22–28%	50%
HDPE	25%	30–35%	45–50%

Further details on coatings and components etc. can be found [here](#).

	Best in class material choice	Best in class colour choice	Why?
Bottle	Bottle – rPET or rHDPE	Clear PET (light blue tinted is also acceptable) or natural HDPE	Clear or natural plastic has the highest market value, and using it provides the greatest opportunity to be recycled into packaging, as well as other products
Cap	HDPE or PP	Minimise colours/ tints in caps (i.e. avoid deep colours)	Minimal use of colours in the caps creates more options for reuse when recycled
Label/sleeve	HDPE or PP label covering less than 40% of the bottle (if a full-body sleeve is necessary the sleeve material should be the same polymer as the bottle)	n/a	Labels commonly do not get recycled therefore the smaller the label, the better. Ideally less than 40% and a maximum of 60% in order to ensure the bottle material is correctly identified



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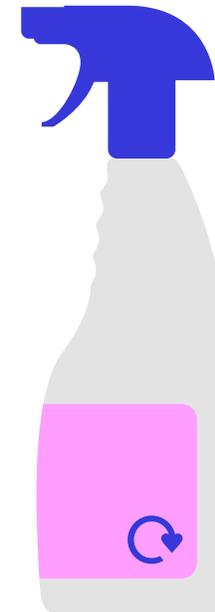
Latest OPRL guidelines available at: www.oprl.org.uk

BEST PRACTICE GUIDANCE BOTTLES (NON-FOOD OR DRINK)

Recycled content ambition	2019	2022	2025
PET	10%	20%	40%
HDPE	10–15%	20%	40–45%
PP	5%	10%	20%

Further details on coatings and components etc. can be found [here](#).

	Best in class material choice	Best in class colour choice	Why?
Bottle	rPET/rHDPE/rPP	Clear PET (light blue tinted is also acceptable) HDPE not natural or white – any NIR detectable colour PP any NIR detectable colour	Using clear PET provides the greatest opportunity to be recycled into packaging, as well as other products For HDPE – food and non-food contact packaging is primarily sorted on the basis of colour, and this is important to meet legislative requirements. Keeping food packaging in natural and non-food packaging in (NIR detectable) colours aids this in HDPE. White HDPE can be detected as natural
Cap/pump/trigger	HDPE or PP	Minimise colours in caps	Minimal use of colours in the caps creates more options for reuse when recycled
Label/sleeve	HDPE or PP label covering less than 40% of the bottle (if a full-body sleeve is necessary the sleeve material should be the same polymer as the bottle)	n/a	Labels commonly do not get recycled therefore the smaller the label, the better. Ideally less than 40% and a maximum of 60% in order to ensure the bottle material is correctly identified



On-pack messaging to include:

- Empty
- Flatten
- Cap on
- www.recyclenow.com

Latest OPRL guidelines available at: www.oprl.org.uk

BEST PRACTICE GUIDANCE

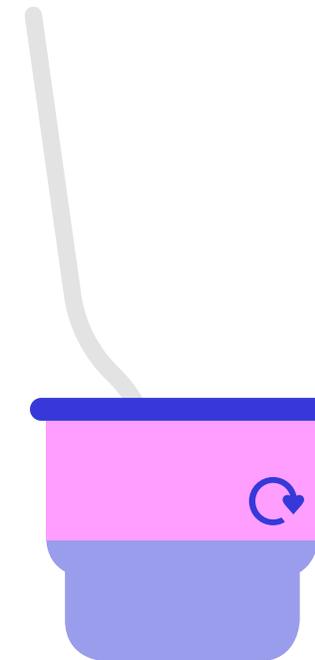
POTS, TUBS AND TRAYS (FOOD AND DRINK)

Further details on coatings and components etc. can be found [here](#).

Recycled content prediction	2019	2022	2025
PET	70%	50%	35–40%

At the current time, much recycled PET from bottles is used in the manufacture of pots/tubs/trays. The percentages predicted here reflect an increase in bottle to bottle recycling is likely to affect the availability of material for trays. It is recognised that PET tray to tray recycling needs to be improved.

	Best in class material choice	Best in class colour choice	Why?
Tray/pot/tub/lid	<p>rPET/PET/PP (and rPP when available)</p> <p>cPET (typically used for ready meals)</p> <p>Lid same material as pot/tub</p>	<p>Clear PET</p> <p>It is not possible for cPET to be 'clear', but 'natural ranges' are available</p>	<p>Using clear PET provides the greatest opportunity to be recycled into packaging, as well as other products</p> <p>For PP, since it is currently not possible to recycle it into food grade packaging, the colour is less important, but it should always be NIR detectable</p> <p>Using 'natural' cPET is resource efficient as it allows waste created during production of trays to be used back into trays, as well as a high level of recycled content</p>
Label	<p>HDPE/PP label covering less than 40% of the pot/tub. If a full body decoration is necessary use the same polymer as the pot/tub, e.g. PP in-mould label on a PP margarine tub</p>	<p>n/a</p>	<p>Labels commonly do not get recycled therefore the smaller the label, the better</p> <p>A label covering less than 40% of the pot/tub allows the recyclers to automatically identify the base polymer</p>



On-pack messaging to include:

- Empty and rinse
- Lid on (if rigid plastic)
- www.recyclenow.com

Latest OPRL guidelines available at: www.oprl.org.uk

BEST PRACTICE GUIDANCE

POTS, TUBS AND TRAYS (NON-FOOD OR DRINK)

Further details on coatings and components etc. can be found [here](#).

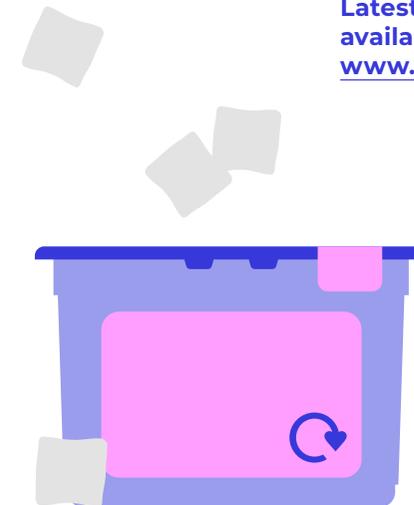
Recycled content prediction	2019	2022	2025
PET	70%	50%	35–40%
PP	20%	30–35%	50%

	Best in class material choice	Best in class colour choice	Why?
Tray/pot/tub/lid	rPP/rPET Lid same material as pot/tub	For PET use clear	Using clear PET provides the greatest opportunity to be recycled into packaging, as well as other products For PP, since it is currently not possible to recycle it into food grade packaging, the colour is less important, but it should always be NIR detectable
Label	HDPE/PP label covering less than 40% of the pot/tub (if full body decoration is necessary, use the same polymer as the pot/tub, e.g. PP in-mould label on PP pot/tub)	n/a	A label covering less than 40% of the pot/tub/tray allows the recyclers to automatically identify the base polymer

On-pack messaging to include:

- Empty and rinse
- Lid on (if rigid plastic)
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Latest OPRL guidelines available at:
www.oprl.org.uk



GLOSSARY

- APET**
Amorphous PET (can be clear)
- CPET**
Crystalline PET (opaque)
- EPS**
Expanded polystyrene
- HDPE**
High density polyethylene
- HIPS**
High impact polystyrene
- LDPE**
Low density polyethylene
- NIR**
Near infrared (spectroscopy)
- PET**
Polyethylene terephthalate
- PP**
Polypropylene
- PS**
Polystyrene
- PVC**
Polyvinyl chloride

RESOURCES

- [Design tips for rigid plastic packaging](#)
- [Eliminating problem plastics](#)
- [Understanding plastic packaging and the language we used to describe it](#)
- [Design tips for paper and card packaging](#)
- [Materials pricing report](#)
- [The UK Plastics Pact](#)
- [On Pack Recycling Labelling](#)
- [Engaging citizens to recycle through the Recycle Now campaign](#)
- [Recycle Now Partner resources](#)



THANK YOU

—— WRAP.ORG.UK/UKPLASTICSPACT
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The UK Plastics Pact is led by WRAP with the support of the Ellen MacArthur Foundation. The UK Plastics Pact was co-created by the Ellen MacArthur Foundation and WRAP to accelerate the transition to a circular economy for plastics in the UK and is one of the Ellen MacArthur Foundation's national and regional implementation initiatives around the world. The opinions expressed, and materials made available, by WRAP or EMF or The UK Plastics Pact signatories do not necessarily reflect the views of the other parties who are not responsible for the same.

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