

The Golden Design Rules

By The Consumer Goods Forum's Plastic Waste Coalition of Action



Plastic Waste

Overview: How to read this document

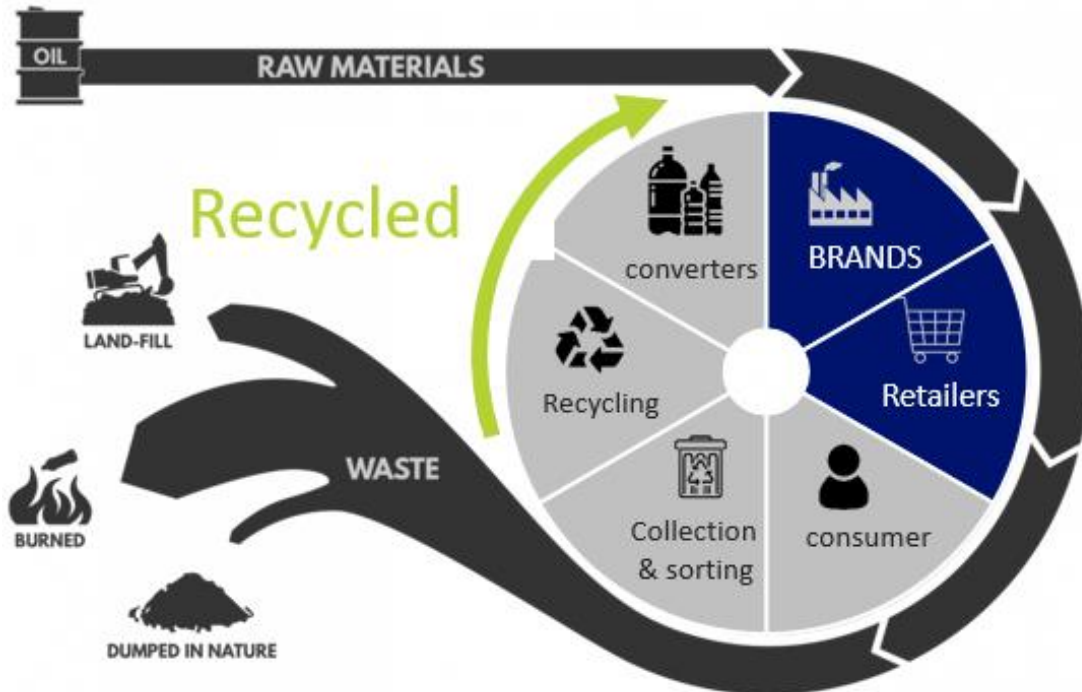


<p>What is the purpose of the document?</p>	<ul style="list-style-type: none"> • Provide a comprehensive guide to the CGF’s Plastic Waste Coalition of Action (PWCoA) Golden Design Rules, to share existing examples of implementation and answer frequently asked questions. The document has 2 sections: <ul style="list-style-type: none"> • Summary: Explain the context of the PWCoA and the Design workstream, introduce the Golden Design Rules, and explain the sign-up process and how implementation will be monitored • Detailed Design Rule Chapters: Give information on the vision, rationale and scope of design rules, provide examples of implementation and answer frequently asked questions
<p>How should this document be used?</p>	<ul style="list-style-type: none"> • Within member companies: Members of the CGF PWCoA Design workstream can use this document (or parts of it) internally in their companies to support conversations about sign up to and implementation of the Golden Design Rules • For communication: Information in this document may be used to support communication about the Golden Design Rules • Disclaimer: All information provided by CGF in this Fact Pack is for guidance only and may vary for different markets and packaging applications. Member companies are recommended not to rely solely on the information in the Fact Pack to make decisions on signing up to Golden Design Rules or for communication about the Golden Design Rules
<p>How should the GDRs and the GDR Factpack be interpreted and followed?</p>	<ul style="list-style-type: none"> • The GDRs are voluntary, single-use packaging guidelines to help companies make harmonized, global design choices which help improve recycling systems and reduce plastic waste • Rules 1-7 & 9 relate to consumer facing packaging (packaging that will ultimately find its way into consumer household waste). Rule 8 relates to B2B logistics packaging • This fact pack contains full GDR guidance for companies, and it is the responsibility of endorsing companies to interpret the guidance in the fact pack as they see fit in order to implement changes and report on progress • The GDR Factpack provides as much guidance as is possible for global-guidelines. Where existing regional or national guidelines provide more detailed guidance (e.g. APR guidelines in USA or RecyClass guidelines in Europe) and support the objectives of the GDR (increase in recycling value and/ or compatibility with recycling processes) companies should implement packaging changes that are consistent with those guidelines • Where members suggest changes to guidelines, this should be reported to the CGF and it will be taken into consideration during the next GDR Review period

Background: 40 manufacturers and retailers are part of The Consumer Goods Forum's Plastic Waste Coalition of Action (PWCoA) to galvanise industry change towards sustainable change



The PWCoA is a CEO-sponsored, multi-stakeholder initiative to drive action to reach the New Plastics Economy Global Commitment target



PWCoA Membership's Responsibility:

- **Less Plastic:** Avoid unnecessary use
- **Better Plastic:** Recyclable and using recycled content
- **Better System:** Supporting effective reuse and recycling systems

PWCoA Membership's Opportunity:

- **Harness collective ambition** of our companies and supply chains
- **Reach a tipping point** to catalyse industry-wide change
- **Take control** of the plastics agenda and protect our oceans and ecosystems

Contents



GDR Background	5
GDR Reporting Process	10
Golden Design Rules	11
• Rule 1: Increasing recycling value in PET	12
• Rule 2: Eliminate problematic elements	20
• Rule 3: Eliminate excess headspace	32
• Rule 4: Reduce plastic overwraps	49
• Rule 5: Increase recycling value in PET trays	56
• Rule 6: Increase recycling value in flexible consumer packaging	63
• Rule 7: Increase recycling value in rigid HDPE and PP	69
• Rule 8: Reduce virgin plastic in B2B packaging	74
• Rule 9: Use on-pack recycling instructions	78
Appendix	82

Background: The PWCoA recognised need to develop globally aligned design guidelines that synthesise the common elements of numerous regional design guidelines



We currently have high level commitments and detailed design guidelines...

- Targets in New Plastics Economy Global Commitment e.g., “100% reusable, recyclable or compostable by 2025”
- Technical eco-design guidelines e.g., Association of Plastic Recyclers (190 pages)

But despite the fact that design is fully within our control, we still see...

- **Excess packaging** used only for marketing e.g., “shipping air” in oversized packaging
- **Packaging design choices** with no chance of being recycled back to packaging - and critical shortage of recycled plastics for packaging
- **Use of problematic plastics** that disrupt recycling



Golden Design Rules

Leading companies jointly and voluntarily committing to specific design changes to reduce plastic waste and increase recycling, aligned with technical guidelines.

Background: The Design workstream has aligned on a short list of timebound (latest 2025) design changes that will create value for the system



- They believed that **collectively achieving several concrete “Golden Design Rules”** will create **significant value for the system** and **build momentum** for achieving further design changes required to achieve the New Plastics Economy Global Commitment targets in the medium term
- The Coalition have **identified a full suite of 9 “Golden Design Rules”** – voluntary, visible, ambitious changes that require convergent action to achieve progress
- The Golden Design rules have been developed based on the common elements of **expert design guidelines, retailer design guidelines, advice** published by reputable bodies, work of **Plastics Pacts and country-specific legislation**, and have been adapted by **member company experts** who have been part of the Design workstream
- Companies are asked to **voluntarily commit to implement this short list of specific, timebound (latest 2025) design changes** to reduce excess packaging and ensure necessary packaging is recycled in practice and at scale

Overview: What is a company committing to by signing up to the Golden Design Rules?



1. Making a public voluntary commitment	<ul style="list-style-type: none">• The Golden Design Rules are voluntary commitments made by companies• Companies are encouraged to sign up to all the rules, but can choose to sign up to selected rules if they wish• Signatories of each rule will be listed on the CGF website
2. Implementing the Golden Design Rules	<ul style="list-style-type: none">• The voluntary commitment is to implement the Golden Design Rules by 2025 and to report annually on progress• Companies have the opportunity to note where they are technically unable to implement the Rules by raising reasonable exceptions in the reporting process
3. Reporting progress on implementation	<ul style="list-style-type: none">• By signing up to the Golden Design Rules, companies commit to report annually to the CGF on implementation progress, in an aligned process• The CGF will report in aggregate on implementation progress but not share any individual company data, unless companies provide explicit permission

The full suite of 9 Golden Resign Rules (GDRs) together address the vast majority of the total global plastics packaging market

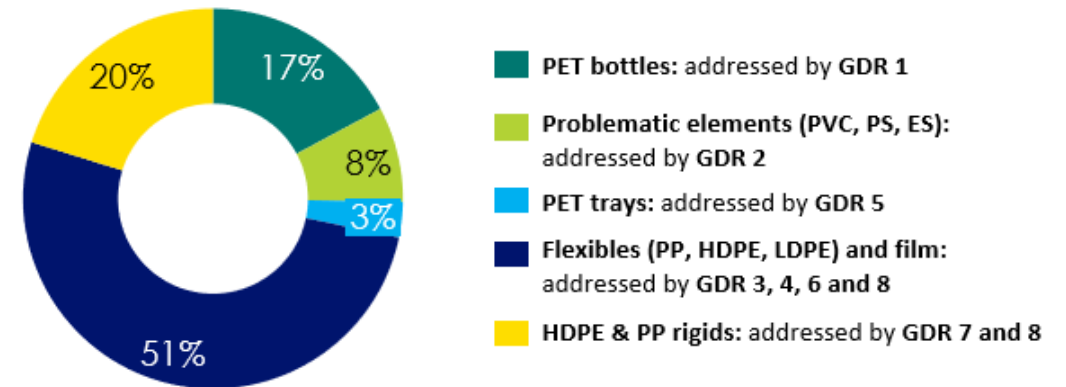


The Golden Design Rules

- ① Increase recycling value in PET
- ② Eliminate problematic elements from plastic packaging
- ③ Eliminate excess headspace
- ④ Reduce plastic overwraps
- ⑤ Increase recycling value in PET trays
- ⑥ Increase recycling value in consumer flexible packaging
- ⑦ Increase recycling value in rigid HDPE and PP
- ⑧ Reduce virgin plastic in B2B packaging
- ⑨ Use on-pack recycling instructions

Universal adoption of the GDRs would address all plastics packaging globally

Share of plastic packaging by type, and how they are addressed by GDRs¹



NB: GDRs 8 & 9 are cross cutting:

- B2B plastic packaging (GDR 8) represents an estimated 7-10% of the total plastic packaging market globally²
- On-pack recycling instructions (GDR 9) applies to all consumer plastic packaging

Note: The donut represents all plastic packaging and only refers to packaging where plastic is the dominant material
Sources: ¹ EMF Global Commitment Progress Report 2020; ² SYSTEMIQ analysis

Each Golden Design Rule is aligned to a specific overarching objective

A Eliminate problematic or unnecessary packaging

B Increase recycling value for packaging types that are recycled at scale in today's recycling system

C Increase recycling value in future recycling system(s) for packaging types not recycled at scale today¹

D Improve environmental performance of B2B packaging

E Improve consumer communications

2 Eliminate problematic elements from plastic packaging

3 Eliminate excess headspace

4 Reduce plastic overwraps

1 Increase recycling value in PET

7 Increase recycling value in rigid HDPE and PP

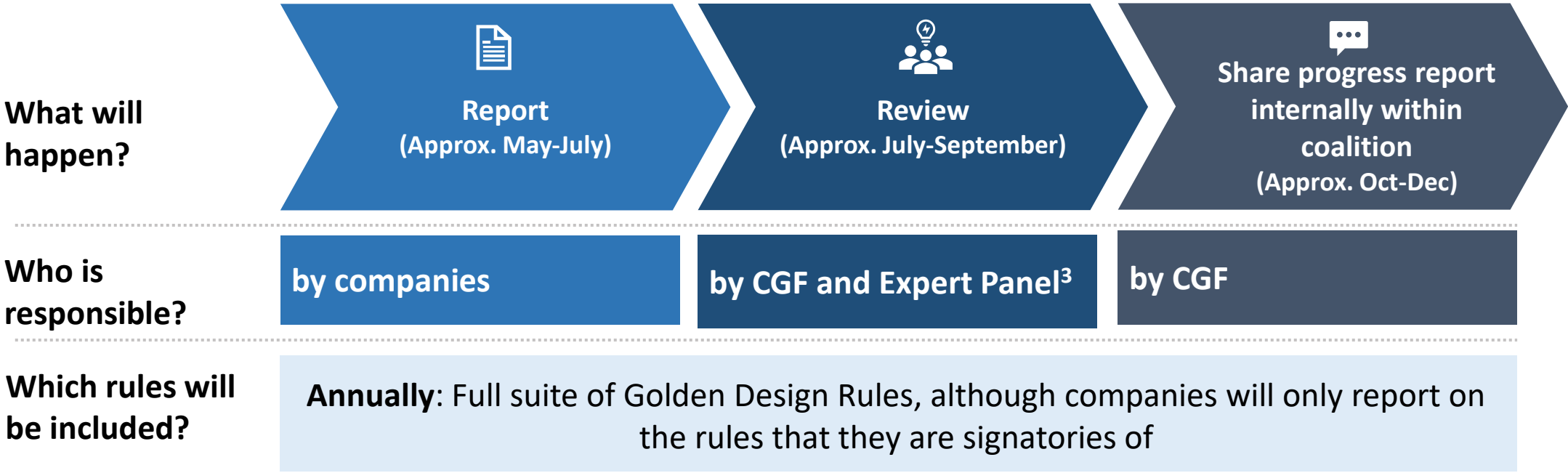
5 Increase recycling value in PET trays

6 Increase recycling value in consumer flexible packaging

8 Reduce virgin plastic in B2B packaging

9 Use on-pack recycling instructions

Reporting: The reporting process has been developed in alignment with the EMF Global Commitment¹



Notes: 1) Process was reviewed for integration of all rules 1-9 into the reporting process, which will take place separately to the EMF Global Commitment reporting process 2) These are voluntary independent commitments by individual companies; 3) If deemed necessary, the CGF consolidates company submissions as well as expert panel recommendations



Golden Design Rules

Rule 1: Increasing recycling value in PET

Rule 2: Eliminate problematic elements

Rule 3: Eliminate excess headspace

Rule 4: Reduce plastic overwraps

Rule 5: Increase recycling value in PET trays

Rule 6: Increase recycling value in flexible consumer packaging

Rule 7: Increase recycling value in rigid HDPE and PP

Rule 8: Reduce virgin plastic in B2B packaging

Rule 9: Use on-pack recycling instructions



Golden Design Rule 1

Commitment*: Increase recycling value in PET

- a) Use transparent and uncoloured PET (preferred), or transparent blue or green in all PET bottles¹
- b) Ensure material choice, adhesive choice and size of sleeve or label is not problematic for recycling²

B

Increase recycling value for packaging types that are recycled at scale in today's recycling system

* These are voluntary independent commitments by individual companies

Notes: 1) With a minimum L value of 40; 2) Including phase out of PETG and PLA labels/sleeves, non-water soluble/dispersible adhesives and sleeves that cover more than 75% of bottle (unless proven not to limit the recyclability of the product) – where regional guidelines provide more detailed guidance
Note: where regional guidelines provide more detailed guidance and indicate compatibility with recycling process, please follow those (e.g. APR in the US and RecyClass in Europe)

, please follow those (e.g. APR in the US and RecyClass in Europe)

Rule 1: Increase value in PET recycling



Increase value in PET recycling	<p>a) Use transparent and uncoloured PET (preferred), or transparent blue or green in all PET bottles¹</p> <p>b) Ensure material choice, adhesive choice and size of sleeve or label is not problematic for recycling²</p>
Rationale	<ul style="list-style-type: none"> • PET bottles are still mostly wasted or downcycled into lower value products; improved design is one key element to prevent this • Switch from coloured to clear PET bottles creates \$1bn in additional material value and means that bottles are more likely to be recycled back into bottles in closed-loop mechanical recycling systems³
Scope of application	<ul style="list-style-type: none"> • All PET bottles, including both beverages and non-food applications (e.g. beverages, home care products, personal care products, etc.)
Product category examples⁴	<ul style="list-style-type: none"> • Drinks bottles • Bottled sauces • Cleaning products • Consumer health and hygiene products • Cosmetics
Exceptions	<p>a) Where barrier protections (for UV light, CO₂, or O₂) are required for product shelf life and other solutions (e.g., full-body sleeves) are not possible</p> <p>b) Unless proven not to limit the recyclability of the product (e.g. cPET, sleeves that detach during recycling processes prior to optical sorting)</p> <p>c) Small format, non-recyclable bottles are exempt (see Q&A for more detail on ‘small format’)</p>

1

Rule 1: Increase value in PET recycling



- Ⓐ Transparent PET bottles
- Ⓑ Choices for Non-problematic recycling

Rationale	<ul style="list-style-type: none"> • PET can be a highly recyclable rigid packaging material that has the potential to be recycled back into high-quality applications. • However, only 9% of bottles are currently recycled back into bottles in Europe, destroying value and limiting access to recycled content. An estimated 30% of bottles are coloured or opaque. • By 2030, all PET bottles in the EU need to have 30% recycled content, but the supply may not meet the increased demand • These rules are aligned with published retailer guidelines and third-party guidelines such as APR, EPBP, PRE and WRAP
Benefits to system	<ul style="list-style-type: none"> • A harmonized design change towards only transparent and uncoloured (or lightly coloured) fractions ensures only materials that have a viable closed loop recycling pathway are used and distinctive branding and functionality is not achieved at the cost of good recycling • Light blue colouring of food-grade PET is acceptable by recyclers as it is sorted with clear PET to offset yellowing of rPET • Green coloring is also considered high value and can create a viable closed loop, as the demand and volume for green-transparent rPET remain large enough to create a high value recycling stream • While other light colouring can be accepted by some recyclers, they need significant resources to separate into other streams, and does not make it back to food grade applications. In addition, small amounts of lightly coloured PET could contaminate the clear stream. • Dark or opaque colours are difficult to identify in NIR sorting systems, are detrimental to the rPET quality and are typically sorted out as waste

1

Rule 1: Increase value in PET recycling



- Ⓐ Transparent PET bottles
- Ⓑ Choices for Non-problematic recycling

Benefits to brands/retailers

- Adoption of design principles will positively impact **supply of high quality rPET**, enabling increased access to recycled content (both in food grade and non-food grade applications) necessary to **meet commitments set by PwCoA members**.

“

“Clear and light blue bottles can be recycled back into similar coloured PET products, mixed colour PET can be used only in darker colour applications.”

– *PET market in Europe: State of play (2019)*

“If we want to recycle bottles into new packaging we need to simplify, and design standards would be key. Only clear or light-blue bottles really work for that”

– *Business Development Manager for PET recycling, Wellman International*

”

“

“There is (...) no EU-wide standard definitions for levels of transparent or coloured PET, leading to different nations using differing standards, limiting the potential for intra-EU trade between sorters and recyclers.”

– *PET market in Europe: State of play (2019)*

“The goal with recycling should be to produce a raw material that can become a new raw material and for that quality consistency really matters (...) we could recycle green bottles but there will be 50 shades of green and that makes it loose a lot of value”

– *Business Development Manager for PET recycling, Wellman International*

”

Question	Answer
What is an L-Value?	<p>L-value is a measure of 'lightness' on the colour scale from black (0) to white (100) – this does not relate to the transparency of the bottle. L- Value is an additional requirement to ensure the resulting rPET has higher value due to its clear ('colorless') appearance.</p> <p>All colours with an L-value of less than 40 (or a NIR reflectance $\leq 10\%$) require testing to determine the appropriate APR recyclability category. To evaluate the sorting potential of a plastic article, please refer to APR's benchmark test 'Evaluation of the Near Infrared (NIR) Sorting Potential of a Whole Plastic Article'</p>
How do I prove my 'material choice, adhesive choice or size of sleeve does not limit the product's recyclability'?	<p>APR has multiple definitive tests covering these limits:</p> <ul style="list-style-type: none"> • Materials: Critical Guidance Protocol for Clear PET Resins and Molded Articles • Adhesives: New Delamination test (currently under development) • Size of sleeve: Critical Guidance Protocol for Clear PET Articles with Labels and Closures • Labels & closures: Benchmark test for Clear PET Articles with Labels and Closures <p>For Europe, EPBP has a platform where companies can test their packaging solution. "Quick tests" can be also be downloaded¹</p> <ul style="list-style-type: none"> • For Europe, EPBP has a platform where companies can test their packaging solution. "Quick tests" can be also be downloaded¹ • Alternatively, member companies can refer to local recycling bodies like the PRE or raise any uncertainties with the panel during the exception process
What if a technology comes to the market to allow accurate sorting of different colours?	<ul style="list-style-type: none"> • The design rule can be revised if needed, but first such a technology needs to be proven at scale. Being 'recyclable in principle' is not a strong enough argument for removing design rules that preserve value in the system.
What is recommended for products for which enhanced barrier properties are required?	<ul style="list-style-type: none"> • Only barrier solutions which are acknowledged by industry associations (e.g. EPBP and APR) as not being detrimental to the quality of the clear PET bottle recycling stream should be used. • The impact many barrier solutions have on the optical properties of the recycle is smaller for the colored than the clear PET bottle stream. Green PET bottles should therefore be considered as an efficient and environmental sound option when no barrier solution is available to preserve product freshness without putting the quality of the clear PET bottle stream at risk. (e.g. UV filters, oxygen scavengers, multi layered bottles). The use of recyclable full-body sleeves may be an option (for UV/light sensitive product) but may provoke the wrong sorting of bottle. Please always refer to recycling guidelines issued by local Industry associations.

Notes: 1) see https://www.epbp.org/page/8/downloads#downloads_39

Sources: APR [PET Design Guide](#); REcyClass tool; WRAP [Recyclable Packaging Guidelines](#); EPBP [guidelines](#); APR [Evaluation of the NIR Sorting Potential of a Whole Plastic Article](#); APR [Critical Guidance Protocol for Clear PET Resin and Molded Articles](#); APR [Critical Guidance Protocol for Clear PET Articles with Labels and Closures](#); APR [Benchmark Evaluation for Clear PET Articles with Labels and Closures](#)

Question	Answer
Why is transparent and uncoloured PET preferred?	<ul style="list-style-type: none"> • Clear and transparent bottles are "preferred" to blue or green as they provide the greatest opportunity for the bottle to be recycled back into new high-value products, which will in turn increase the supply of rPET.
Why can I not use other light-colored bottles?	<ul style="list-style-type: none"> • The path for other colours leads predominately to open-loop recycling into lower value products.
Does my closure/label need to be removable by consumers?	<ul style="list-style-type: none"> • The bottles should not rely on consumers to remove labels to be recyclable. Please refer to WRAP's guideline 'Defining What's Recyclable' for on-pack messaging guidance

How do existing guidelines align with our rule on...

Colour	<ul style="list-style-type: none"> • APR, EPBP and WRAP guidance all highlight the preference for transparent, uncoloured PET. <ul style="list-style-type: none"> • APR shows that “transparent colors other than green and light blue” are detrimental to recycling. In their guidance on colour, green is “preferred” above colours. • EPBP state that “transparent, unpigmented PET bottles usually have the widest variety of end-use applications in the highest-valued markets.” In their design guidelines on “transparent coloured PET bottles” they single out green stating there are a number of well-established recycling streams for green recycled PET.” • WRAP “Best practice guidance” indicates ““best in class color choice” is “clear PET (light-blue tinted is also acceptable)” for both food and nonfood bottles.
Label/sleeve coverage	<ul style="list-style-type: none"> • All guidance states that label coverage is expected to readily allow a container to be identified as PET: <ul style="list-style-type: none"> • APR: In their summary table¹ they distinguish labels of coverage above and below 75%. They are currently working on producing guidelines to specify maximum bottle coverage, which was indicated to likely be 75%. Current shrink sleeve guidance² and pressure sensitive guidance³ both state: “Work done by an APR Working Group on demonstration equipment with a single serve container size, developed data indicating that colour sorters can be effective when about 20% of the PET bottle side wall and shoulder surface area is not covered with label” • WRAP guidance specifies coverage of no more than 40% of the surface area.
Adhesives	<ul style="list-style-type: none"> • There is alignment on the current specification to phase out ‘non-water soluble/dispersible adhesives’: <ul style="list-style-type: none"> • Recoup specifies that “Water soluble (or dispersible) at 60 to 80°C (140 to 180°F) and hot melt alkali soluble adhesives are the adhesives of choice as they are the most readily removed during reprocessing.” • APR specifies in their Full Design Guide, that non-water soluble/dispersible adhesives are detrimental to recycling. • EPBP specify that the use of adhesives that are alkali/water soluble and alkali/water releasable at 60-80 C without reactivation is preferred. The use of hot-melt adhesives is undesirable, unless the adhesives are alkali-soluble at maximum 80°C and are readily removed during a conventional (pre)washing process. Other hot-melts should be avoided.
Small formats	<ul style="list-style-type: none"> • ‘Small formats’ can be considered as an exception if they meet industry guidance and test criteria for sorting potential. • The waste management industry will need to find a solution to recover these items. Meanwhile, designers are encouraged to design packaging in accordance with the detailed guidelines set out by recyclers (e.g. PRE, WRAP and APR). <ul style="list-style-type: none"> • APR classifies small format as “Items smaller than 2 inches in 2 dimensions”¹, while WRAP defines them as smaller than 50 x 50 mm packaging items. Please note, this guidance can change over time in line with changes in sorting machinery. • In order to test the recyclability, please refer to guidelines such as APR’s benchmark test called ‘<i>Evaluation of Size Sorting Potential for Articles with at least 2 Dimensions Less than 2 Inches</i>’.



Golden Design Rule 2

Commitment*: Remove problematic elements from plastic packaging

- a) No undetectable¹ carbon black
- b) No PVC or PVDC
- c) No EPS or PS
- d) No PETG in rigid plastic packaging
- e) No oxo-degradable






A

Eliminate problematic or unnecessary packaging

* These are voluntary independent commitments by individual companies
Notes: 1) Undetectable means by commonly-used sortation technologies;

Rule 2: Remove problematic elements from packaging




Problematic elements for elimination		Rationale	Example applications
A	Carbon black	Not detected in sortation, always landfilled or incinerated	 Meat trays, bottles, vegetable trays
B	PVC and PVDC	Rarely recycled when in packaging and problematic if in the recycling stream	 Meat trays, plastic film around vegetables or blister packs
C	EPS and PS	Unviable recycling economics, and alternatives readily available	 Food takeaway containers, yoghurt pots, cushioning / filler
D	PETG in rigid plastic packaging	Ruins every batch of PET recycling	 Drinking bottles, cooking oil containers
E	Oxo-degradables	Fragment into microplastics, problematic in recycling stream	 Shrink & stretch film, carrier bags, blister packs, bottles, labels and caps
Rationale	<ul style="list-style-type: none"> Problematic elements are still widely used despite awareness of their interference with recycling > \$400 million boost to recycling system¹ 		
Scope of application	<ul style="list-style-type: none"> This GDR relates to all consumer facing packaging (packaging that will ultimately end up in consumer household waste stream) Plastic store bags are out of scope 		
Company commitments	<ul style="list-style-type: none"> Make a public commitment to implement by 2025 Remove these elements from all packaging specifications Report transparently on progress to implementation (through EMF or your local Plastics Pact if you are members, or aligned to this reporting cycle if you are not) 		

Rule 2: Remove problematic elements from packaging



A No detectable carbon black

Rationale	<ul style="list-style-type: none"> Most conventional dark colored plastic packaging is colored using carbon black pigments which do not enable the pack to be sorted using Near Infra-Red (NIR) technology widely used in plastics recycling. As a result, dark coloured plastic packaging commonly ends up as residue and is disposed of in landfill or incinerated. Phasing out carbon black from packaging is a straightforward design change without negative impact on functionality and is likely to lead to increased recycling rates. Eliminating carbon black pigment is consistent with published eco-design guidelines
Scope of application	<ul style="list-style-type: none"> This rule applies to all packaging for the consumer market “Undetectable” means by commonly-used sortation technologies
Example applications	 It can be found in various packaging applications, such as meat or vegetable trays and bottles
Exceptions	<ul style="list-style-type: none"> Small non-recyclable packs exempt. Please refer to the FAQs for further information
Impact of global implementation of this rule	<ul style="list-style-type: none"> The elimination of carbon black pigment in packaging reduces losses in the sorting process and increase recycling rates As well as minimizing avoidable environmental impacts, removing carbon black would increase the volume of recycled plastic by 150-200k tonnes¹ of plastic packaging in Europe alone.

2 There is growing momentum



A No detectable carbon black

Growing momentum



There is **already strong momentum** among brands and retailers to phase out carbon black pigment from packaging, and a clear commitment to do so demonstrates leadership


- **12 of the PWCoA members** have made public commitments (NPEC Global Commitment) to phase out carbon black, latest by 2025
- The design change is feasible and helps manufacturers and retailers **deliver on sustainability goals**

2

Rule 2: Remove problematic elements from packaging



Ⓑ No PVC or PVDC

<p>Rationale</p>	<p>PVC/PVDC is problematic when used for and within packaging because it is uncommon in packaging and therefore systems do not exist to recycle PVC from packaging at scale and it can disrupt recycling of other plastics. Furthermore, eliminating PVC is consistent with published retailer and 3rd party guidelines</p> <p>PVC/PVDC is disruptive to the recycling of some other plastics. For example:</p> <ul style="list-style-type: none"> • PVC mixes with PET and lowers recyclate value due to the breakdown and release of hydrochloric acid during reprocessing. • While PVC can be identified by sorting equipment, smaller quantities in sleeves, labels and coatings can pass unnoticed and contaminate the recycling fractions. Even small concentrations of PVC (0.005% by weight) lead to quality reductions in recycled PET. Recyclers often do not have machines to detect and remove these quantities. • The acid formed during breakdown is corrosive to metal equipment and PVC / PVDC would therefore also be disruptive to pyrolysis-based chemical recycling.
<p>Scope of application</p>	<ul style="list-style-type: none"> • All packaging for the consumer market including all aspects of the package and its components including labels, sleeves etc.
<p>Example applications</p>	 It can be found in various forms, such as meat trays, plastic film around vegetables or blister packs
<p>Exceptions</p>	<ul style="list-style-type: none"> • Except in medical applications where there is no alternative • Small non-recyclable packs exempt. Please refer to the FAQs for further information

2

Rule 2: Remove problematic elements from packaging



Ⓑ No PVC or PVDC

Impact of global implementation of this rule

- Removing PVC and PVDC and substituting with recyclable materials will increase recycling rates and reduce disruptions to the recycling of some other plastics

2

Rule 2: There is growing momentum



B No PVC or PVDC

Growing momentum




There is already a strong shift away from PVC in packaging

- **18 PWCoA members** have already made public commitments to phase out PVC, latest by 2025
- **Several countries, regions and cities** in Europe and the US have restricted PVC or its additives in some way
- PVC is highlighted as a problematic material in many **retailer guidelines** (e.g. Walmart recycling playbook, the Tesco preferred materials, etc.) with a clear request to switch them.
- The design change is feasible and helps manufacturers and retailers **deliver on sustainability goals**

Rule 2: Remove problematic elements from packaging



Ⓒ No EPS or PS

Rationale	<ul style="list-style-type: none"> (E)PS is too uncommon in the packaging materials stream to make recycling economically viable. As a result it is rarely sorted from household waste and recycled, with the majority incinerated or landfilled. EPS has been identified as a contaminant for polyolefin recyclers as it is not removed during the float-sink separation process. Eliminating (E)PS is also consistent with published consistent with published eco-design guidelines.
Scope of application	<ul style="list-style-type: none"> Includes all types of PS (incl. EPS, HIPS, GPS, OPS, etc.) Excludes other types of styrene such as SAN or ABS
Example applications	 Often used for food takeaway containers, yoghurt pots and as cushioning/fillers (e.g., to package white goods like microwaves).
Exceptions	<ul style="list-style-type: none"> Small non-recyclable packs exempt. Please refer to the FAQs for further information.
Impact of global implementation of this rule	<ul style="list-style-type: none"> There are feasible replacements for (E)PS in most packaging applications, which could improve system economics by an estimated USD 15-20 per tonne of mixed plastic packaging collected.

Rule 2: There is growing momentum

Ⓒ No EPS or PS



Growing momentum




There is strong momentum among brands and retailers to phase out the use of (E)PS, and a clear commitment to do so demonstrates leadership. Some **national governments and cities have already banned** its use or have begun phasing out certain applications:

- **15 of the PWCoA members** have already made public commitments (NPEC Global Commitment) to eliminate PS, latest by 2025. Of these, 3 have committed to eliminate (E)PS as well, which has already been fully implemented by Henkel
- As the elimination of (E)PS packaging is already underway, the share of this material in the global packaging market is already declining. **Accelerating this process offers the opportunity for a 'quick win'**

Rule 2: Remove problematic elements from packaging



ⓓ No PETG in rigid plastic packaging

Rationale	<ul style="list-style-type: none">PETG contaminates the PET recycling stream because it has a lower melting point than PET, which creates clumps that disrupt the recycling processes and equipment and lowers the value of the PET flakes.PETG has higher density than water and cannot be separated from PET flakes during the sink-float separation of recycling, thereby contaminating the rPET stream and deteriorating the rPET quality.The low concentration of PETG in the packaging waste stream as well as the limited end-market for PETG mean that sorting and recycling is generally not economically viable.
Scope of application	<ul style="list-style-type: none">All single-use, rigid packaging for the consumer market.
Example applications	 PETG can be found in drinking bottles, food containers, cooking oil containers
Exceptions	<ul style="list-style-type: none">Medical applications where there is no alternativeSmall non-recyclable packs exempt. Please refer to the FAQs for further information
Impact of global implementation of this rule	<ul style="list-style-type: none">Replacing PETG with recyclable plastics leads to increases in recycling ratesReduces disruption to PET recycling processes.

Rule 2: Remove problematic elements from packaging



Ⓔ No oxo-degradable

Rationale	<ul style="list-style-type: none"> Oxo-degradable plastics contribute to microplastic pollution and are not suited for effective long-term reuse, recycling at scale or composting.
Scope of application	<ul style="list-style-type: none"> The rule applies to all oxo-degradable plastics. <ul style="list-style-type: none"> “Oxo-degradation” is specified by CEN (the European Standards authority) in TR 15351:2006 as “degradation identified as resulting from oxidative cleavage of macromolecules.”
Example applications	 Applications include shrink and stretch film, carrier bags, blister packs, bottles, labels and caps
Exceptions	<ul style="list-style-type: none"> Except where legally required <ul style="list-style-type: none"> While the European Commission has recommended EU-wide measures be taken against oxo-degradable plastics, several countries in the Middle-East and Africa are promoting the use of oxo-biodegradable plastics and have made their use mandatory² This rule does not apply to oxo-biodegradable plastics. The difference between oxo-degradation and oxo-biodegradation has been specified by CEN (the European Standards authority) in TR 15351:2006 where “Oxo-biodegradation” is “degradation resulting from oxidative and cell-mediated phenomena, either simultaneously or successively”.
Impact of global implementation of this rule	<ul style="list-style-type: none"> Prevent the formation of microplastics Substitution with reusable, recyclable or compostable materials improves overall circularity of packaging

Rule 2: FAQ



Topic	Question	Answer
Overall rule	Why are small packs exempt ?	<ul style="list-style-type: none"> • Small packs are not commonly recycled today, and therefore the impact of removing elements that are problematic for recycling from small packs is minimal. • The waste management industry will need to find a solution to recover these items. Meanwhile, designers are encouraged to design packaging in accordance with the detailed guidelines set out by recyclers (e.g. PRE, WRAP and APR). <ul style="list-style-type: none"> • APR classifies small format as “Items smaller than 2 inches in 2 dimensions”¹, while WRAP defines them as smaller than 50 x 50 mm packaging items. Please note, this guidance can change over time in line with changes in sorting machinery. • In order to test the recyclability, please refer to guidelines such as APR’s benchmark test called ‘<i>Evaluation of Size Sorting Potential for Articles with at least 2 Dimensions Less than 2 Inches</i>’.
Carbon black	What about detectable black pigment?	<ul style="list-style-type: none"> • Even if detectable, black pigment, along with any dark pigments, is disruptive to recycling processes and reduces the value of the recyclate. Reducing the use of pigment more broadly, beyond black carbon pigment, is in line with all major design guidelines.
	How can brands differentiate themselves if dark colours are removed?	<ul style="list-style-type: none"> • Labels, when used appropriately, can still be used to express brand identity.



Golden Design Rule 3

Commitment*: Eliminate excess headspace

- Eliminate excess headspace for all flexible pack types, such that the maximum headspace is 30% or less across the following product categories:
- Cleaning products, confectionary, dry groceries, frozen foods & ice-cream, health & wellness, personal & baby care, pet food, produce & fresh food, shelf stable foods, water & beverages

A

Eliminate problematic or unnecessary packaging

Rule 3: Eliminate excess headspace



Reduce Excess packaging^{1, 2}	<ul style="list-style-type: none"> ▪ Eliminate excess headspace for all flexible pack types, such that the maximum headspace is 30% or less across the following product categories: cleaning products, confectionary, dry groceries, frozen foods & ice-cream, health & wellness, personal & baby care, pet food, produce & fresh food, shelf stable foods, water & beverages
Scope of application	<ul style="list-style-type: none"> • All flexible pack types such as pouches, bags and flow wraps. Examples include: <ul style="list-style-type: none"> Food: <ul style="list-style-type: none"> • Confectionary and snacks • Dry groceries • Frozen foods and ice-cream • Produce and fresh food • Shelf stable foods • Beverages Non-food: <ul style="list-style-type: none"> • Cleaning products • Health and wellness • Personal and baby care • Pet food
Exceptions⁴	<ul style="list-style-type: none"> • Functional requirements as defined by the International Organization of Legal Metrology (see detailed chapter for definition)
Company commitments	<ul style="list-style-type: none"> • Make a public commitment to implement by 2025 • Measure headspace in a uniform way (see detailed chapter for methodology) • Integrate into relevant packaging specifications and apply to all packaging renovations and innovations by 2025 • Optional: conduct own internal audits / spot checks to validate implementation • Report transparently on progress to implementation (through the reporting template for the Global Commitment to a New Plastics Economy, or aligned to the Global Commitment reporting cycle if you are not)

3 Rule 3: Eliminate excess headspace for all flexible packs such that the maximum headspace is 30% or less



Rationale	<ul style="list-style-type: none"> • Many companies have committed to removing unnecessary plastic packaging, but guidelines to specify what plastic is unnecessary are needed • Members unanimously indicated there is an opportunity to reduce headspace¹
Benefits to system	<ul style="list-style-type: none"> • By eliminating excess headspace in flexible packaging, companies reduce the demand for virgin plastic and reduce the absolute amount of plastic being placed on to the market
Benefits to brand/retailers	<ul style="list-style-type: none"> • Through NPEC commitments, signatories have committed to eliminate unnecessary packaging • Reducing the amount of flexible packaging used helps businesses fulfil voluntary reduction / elimination targets • Unnecessary headspace is essentially ‘packaging air’, so reducing it can lead to direct savings on packaging material as well as cost and emissions in transport

Source: 1) PWCoA working groups: All 11 participants answered “yes” to the question “do you think we can achieve significant headspace reduction?”

3

The rule is aligned with existing regulations in Europe...



WELMEC¹	<ul style="list-style-type: none"> A package consisting a non-transparent container should be examined in more detail if the free space is greater than 30% of the volume of the pre-package. Consideration should be given as to whether or not the free space results from the nature of the product or is the result of an unavoidable technical reason. If it is not found to be the case, then a package in a non-transparent container with a free space greater than 30% should be rejected
International Organization of Legal Metrology¹	<ul style="list-style-type: none"> “...shall be filled in such a manner that a purchaser may not reasonably be misled with respect to the quantity of the product it contains” “If a purchaser cannot fully view the product in a pre-package... it shall be misleading if it contains excessive non-functional slack fill that is not required by any production process. “ <p><i>Note:</i> Slack fill might be necessary for the following reasons which should not be regarded as misleading:</p> <ol style="list-style-type: none"> Protection of the product; The requirements of machines used for enclosing the contents of the pre-package; Unavoidable product settling during shipping and handling; and The need for a pre-package to perform a specific function (e.g. where packaging plays a role in the preparation or consumption of a food)
Europe²	<ul style="list-style-type: none"> Non functional slack fill is prohibited by the Packaging and Packaging Waste directive
UK Code of practice¹	<ul style="list-style-type: none"> “Consumer packaging must not be designed to give a false impression of the nature, quantity or quality of the contents” “With some products and processes, there is a need for packaging to have a headspace in order to allow for changes in density (e.g. settlement) or volume (e.g. as temperatures change). This should be kept to a minimum.”
Germany³	<ul style="list-style-type: none"> It is illegal to launch product packaging which assumes more content than what’s actually inside the pack. Minimum filling ratio should be calculated by the principles of DIN 55540 “Testing of packaging; determining the filling ratio of standard capacity prepacks; prepacks whose contents are indicated by weight”. Maximum headspace of 30% is not a legal requirement

...and aligned with regulations on headspace (“slack-fill”) in North America



<p>Canada¹</p>	<ul style="list-style-type: none"> The Consumer Packaging and Labelling Act, Safe Food for Canadians Act, and Food and Drugs Act, each prohibit pre-packaged products from being sold, advertised or imported into Canada that have been manufactured, constructed, filled or displayed in such a manner that a consumer might reasonably be misled with respect to the quantity of the product If the product justifiably requires extra space within the container and a statement explaining the purpose of the extra space is declared on the label. Both the Competition Bureau and the Canadian Food Inspection Agency CFIA enforce regulations related to slack-fill. Fines range from \$5,000 - \$250,000 with potential for imprisonment for up to three years.
<p>United States²</p>	<ul style="list-style-type: none"> A container with slack fill that serves no functional purpose, <i>i.e.</i> “non-functional slack fill,” could be subject to lawsuits under the Federal Food, Drug, and Cosmetic Act (FDCA) and relevant state regulations. It defines non-functional slack-fill as the empty space in a package that is filled to substantially less than its capacity for reasons other than any one or more of the following six reasons: <ol style="list-style-type: none"> To protect the contents of the package; The requirements of the machinery used to close the package; Unavoidable product settling during shipping and handling; The need for the package to perform a specific function (e.g., in the preparation or consumption of the food) Food packaged in a reusable container where the container is a part of the presentation and also serves a useful purpose independent of the function to hold food The inability to increase the contents or reduce the package size (e.g., a certain size package is necessary to carry all the required label statements, discourage shoplifting, or facilitate handling the product).

“Slack-fill” cases appear to be a fast-growing type of claim aimed at the food and beverage industry in the US, representing approximately 11% of all food and beverage industry legal cases³

Headspace should be measured using this aligned methodology (1 of 4)



Requirements

- All flexible pack types are measured the same way
- One rule for all pack types



When and how to measure

- See following slides for flexible pack types

Note: 1) The International Organization of Legal Metrology indicates that headspace (“Slack fill”) might be necessary for the following reasons which should not be regarded as misleading: a) protection of the product; b) the requirements of machines used for enclosing the contents of the pre-package; c) unavoidable product settling during shipping and handling; and d) the need for a pre-package to perform a specific function (e.g. where packaging plays a role in the preparation or consumption of a food)

)

Measuring headspace – recommendation summary



- The tables in the slides below outline which **methodologies are preferable for measuring headspace in flexible packaging**, depending on the product and pack type.
- The **preferred methodologies for each pack and product type are highlighted in green**. These have been assessed based on how **accurately** they measure headspace (or void*) percentage and how **easily** they can be understood and used.
- The CGF recommends that **per each combination of product and pack type, members select one preferred methodology** (highlighted in 'green' for that product and pack combination) and **consistently use this approach** to measure headspace.
- Measurements should be **taken from just before secondary packing occurs**.
- Under Golden Design Rule 3, the CGF has set a **target of maximum 30% headspace**. The rule is **applicable to each individual product (not individual pack) such that the product's average measurement does not exceed 30%** to account for factors like seasonal volume changes and variation in product density.
- Where there is **local legislation or guidelines** that are more stringent than 30% headspace, these **supersede the CGF guidelines**.

*Some methodologies measure the void in the pack (i.e. all of the empty space in the pack, including the gaps between products and the functional headspace). This figure is different to calculating headspace % and the number is likely to be higher. Therefore, you must set different targets for your packs if you are choosing to calculate void rather than headspace.

Calculating average headspace

Under Golden Design Rule 3, the CGF has set a **target of maximum 30% headspace**. The rule is **applicable to each individual product (not individual pack) such that the product's average measurement does not exceed 30%** to account for factors like seasonal volume changes and variation in product density.

This means that you average the headspace of each product type (e.g. shower gel) across different packs. Using the example* of shower gel:

1) If in your portfolio you sell **shower gel in sachets**:



- You sell ~4 million units per year
- The weight of each sachet (with no product in it) is 10g
- The headspace in those sachets is 20%

AND

2) You sell **shower gel in a stand-up pouch**:



- You sell ~1 million units per year
- The weight of each pouch (with no product in it) is 20g
- The headspace in that pouch is 30%

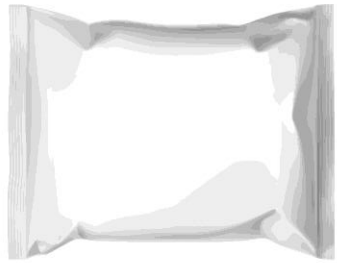
Then the **average headspace for the shower gel product is 23%** because:

- Total weight of plastic packaging = $(4m \times 10g) + (1m \times 20g) = 40,000kg + 20,000kg$
- Therefore, **2/3 of the weight of packaging** for the shower gel has a **headspace of 20%** (the sachets) and **1/3 has a headspace of 30%** (the stand up pouches)
- Therefore $2/3 \times 20\% = 13.3333$ and $1/3 \times 30\% = 10$
- $13.33 + 10 = 23.33$ (round down to 23)

Meaning that the **average headspace of the shower gel across those two pack formats is 23%**

Packaging types

This list of packaging types is not exhaustive, but these are the most common types of flexible packs.



Pillow Pouch



Sachets



Block-bottom bag



Flow wrap



Stand-up pouch



Gusset pouch

Measuring headspace



Assessment

		Liquids, purees, gels (e.g. creams, baby food, yoghurts)	Powders (e.g. sugar sticks, cocoa powder)	Light snacks and foods (e.g. crisps, cereal)	Heavy snacks and food (e.g. candy, pasta)	Frozen produce (e.g. fries, frozen fruits)	Fresh produce (e.g. fruit, herbs)	Solid products (e.g. chocolate bars)	
Flow wrap (without functional additions)	Linear method	Green	Green	Green	Green	Green	Green	Green	Although not highly accurate, this is a simple method that frequently reflects consumer perceptions of headspace
	Displaced cubic volume	Green	Green	Green	Green	Green	Green	Green	Accurate but can be complicated to understand
	Product brim-full method	Green	Green	Green	Green	Green	Green	Green	Accurate but can be hard to use from the product line
	Syringe with water brim-full method	Green*	Green*	Red	Green*	Green*	Green*	Green*	Highly accurate, but refers to 'void' not headspace, so % will be different
	Geometric method	Yellow	Yellow	Red	Yellow	Red	Red	Yellow	Useable, but not highly accurate and can't account for complicated packaging shapes
Flow wrap (with functional additions e.g. scoops, pourers)	Linear method	Green	Green	Green	Green	Green	Green	Green	Although not highly accurate, this is a simple method that frequently reflects consumer perceptions of headspace
	Displaced cubic volume	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Useable, but hard to account for functional additions
	Product brim-full method	Green	Green	Green	Green	Green	Green	Green	Accurate but can be hard to use from the product line
	Syringe with water brim-full method	Green*	Green*	Red	Green*	Green*	Green*	Green*	Highly accurate, but refers to 'void' not headspace, so % will be different
	Geometric method	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Complicated and unlikely to be accurate
Stand up pouch, gusset pouch (without functional additions)	Linear method	Green	Green	Green	Green	Green	Green	Green	Although not highly accurate, this is a simple method that frequently reflects consumer perceptions of headspace
	Displaced cubic volume	Green	Green	Green	Green	Green	Green	Green	Accurate but can be complicated to understand
	Product brim-full method	Green	Green	Green	Green	Green	Green	Green	Accurate but can be hard to use from the product line
	Syringe with water brim-full method	Green*	Green*	Red	Green*	Green*	Green*	Green*	Highly accurate, but refers to 'void' not headspace, so % will be different
	Geometric method	Yellow	Yellow	Red	Yellow	Red	Red	Yellow	Useable, but not highly accurate and can't account for complicated packaging shapes
Stand up pouch, gusset pouch (with functional additions e.g. scoops, pourers)	Linear method	Green	Green	Green	Green	Green	Green	Green	Although not highly accurate, this is a simple method that frequently reflects consumer perceptions of headspace
	Displaced cubic volume	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Useable, but hard to account for functional additions
	Product brim-full method	Green	Green	Green	Green	Green	Green	Green	Accurate but can be hard to use from the product line
	Syringe with water brim-full method	Green*	Green*	Red	Green*	Green*	Green*	Green*	Highly accurate, but refers to 'void' not headspace, so % will be different
	Geometric method	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Complicated and unlikely to be accurate

Measuring headspace

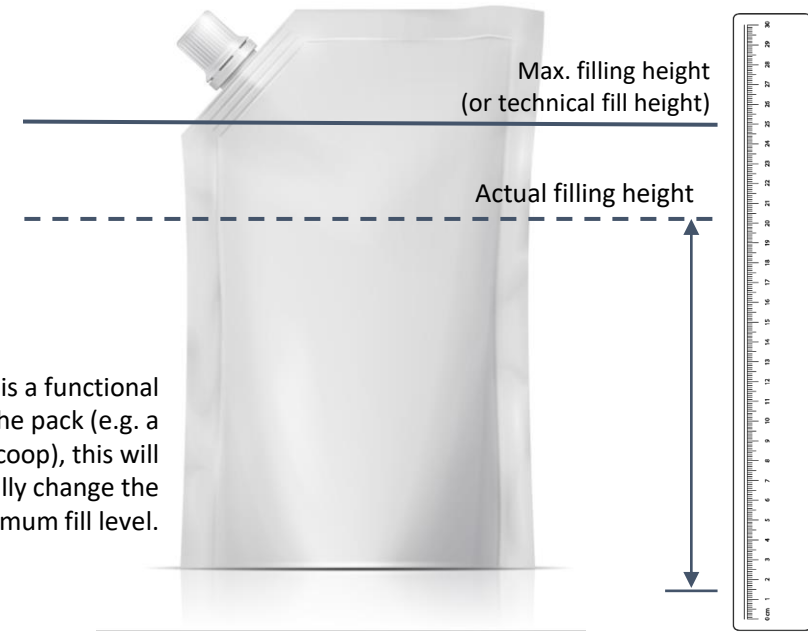


Assessment

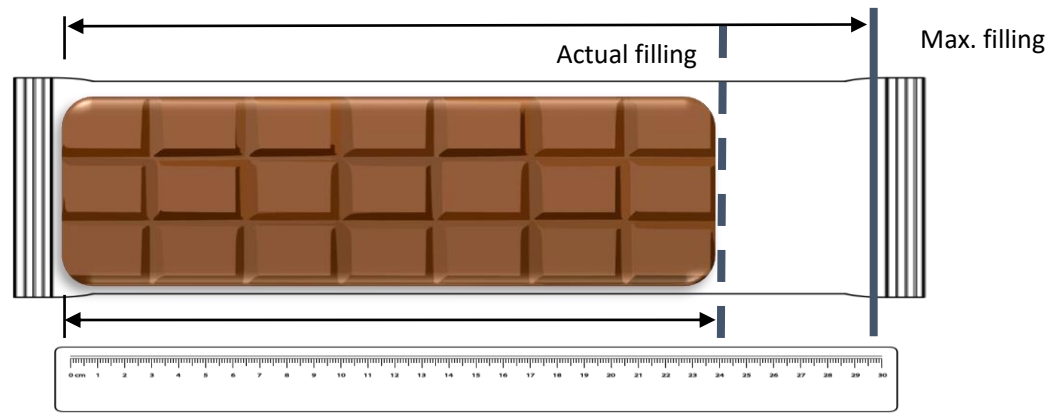
		Liquids, purees, gels (e.g. creams, baby food, yoghurts)	Powders (e.g. sugar sticks, cocoa powder)	Light snacks and foods (e.g. crisps, cereal)	Heavy snacks and food (e.g. candy, pasta)	Frozen produce (e.g. fries, frozen fruits)	Fresh produce (e.g. fruit, herbs)	Solid products (e.g. chocolate bars)	
Pillow pouch	Linear method								This method is more difficult to use for a pillow pouch
	Displaced cubic volume								Accurate but can be complicated to understand
	Product brim-full method								Accurate but can be hard to use from the product line
	Syringe with water brim-full method	*	*		*	*	*	*	Highly accurate, but refers to 'void' not headspace, so % will be different
	Geometric method								Useable, but not highly accurate and can't account for complicated packaging shapes
Sachets	Linear method								Useable - accurate for liquids and powders
	Displaced cubic volume								Accurate but can be complicated to understand
	Product brim-full method								Accurate but can be hard to use from the product line
	Syringe with water brim-full method	*	*		*	*	*	*	Highly accurate, but refers to 'void' not headspace, so % will be different
	Geometric method								Useable and accurate
Block bottom bag (without functional additions)	Linear method								Although not highly accurate, this is a simple method that frequently reflects consumer perceptions of headspace
	Displaced cubic volume								Accurate but can be complicated to understand
	Product brim-full method								Accurate but can be hard to use from the product line
	Syringe with water brim-full method	*	*		*	*	*	*	Highly accurate, but refers to 'void' not headspace, so % will be different
	Geometric method								Useable
Block bottom bag (with functional additions)	Linear method								Although not highly accurate, this is a simple method that frequently reflects consumer perceptions of headspace
	Displaced cubic volume								Accurate but can be complicated to understand
	Product brim-full method								Accurate but can be hard to use from the product line
	Syringe with water brim-full method	*	*		*	*	*	*	Highly accurate, but refers to 'void' not headspace, so % will be different
	Geometric method								Complicated and unlikely to be accurate

1. Linear methodology (currently included in the GDR Fact Pack)

$$\frac{\text{max. filling height} - \text{actual filling height}}{\text{max. filling height}} \times 100 = \% \text{ Headspace}$$



If there is a functional addition to the pack (e.g. a spout or scoop), this will potentially change the maximum fill level.



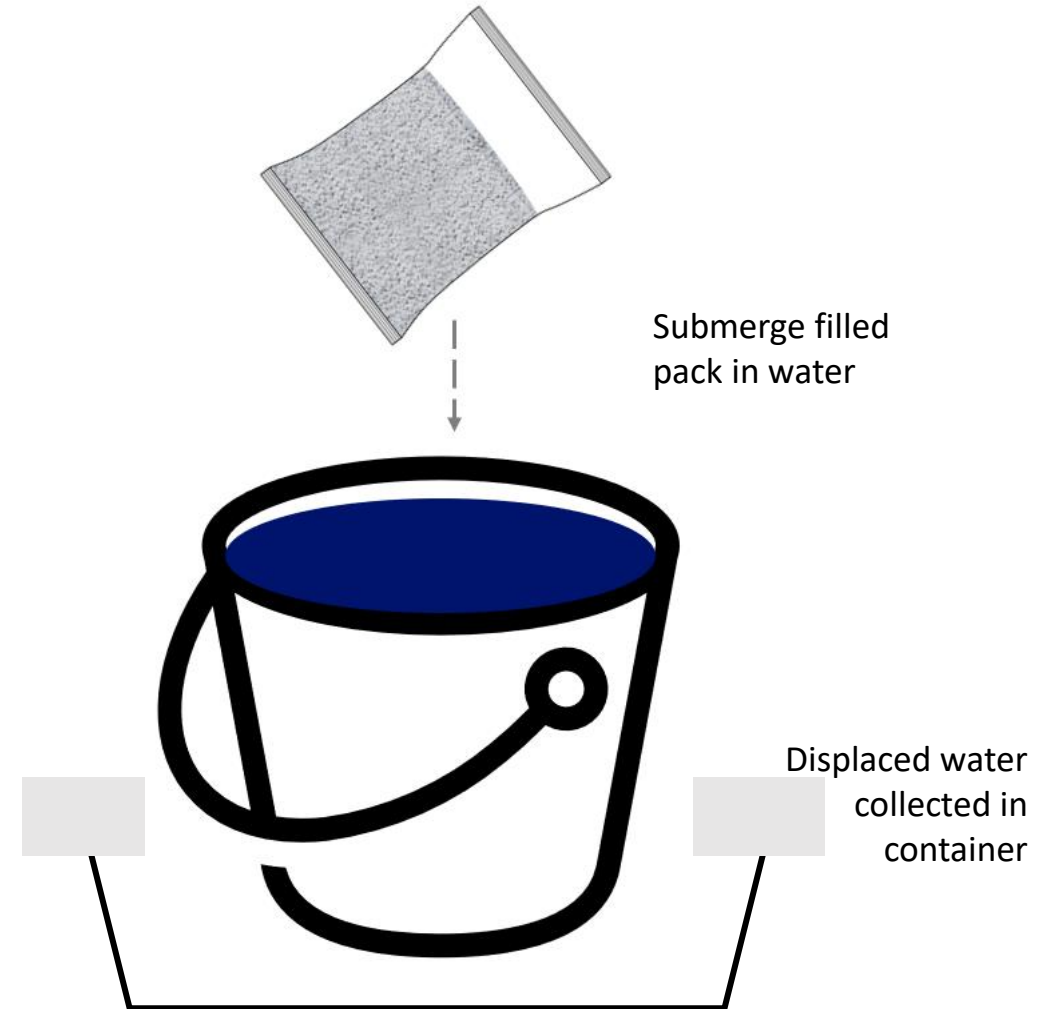
NB: The method technically measures the 'over-height ratio'.

Note: 1) This methodology was developed by Berndt+Partner's technical consultants in conjunction with the PWCoA technical review groups

2. Displaced cubic volume

1. Fill the packaging with your own product using the grammage you plan to sell. Pierce a small hole in the top and gently squeeze out the air from the top of the pack. Place tape over the small pierced hole so no water can enter the pack.
2. Fully submerge into a container of water and record the cubic ml that is displaced from the water (this is measure A).
3. Then, using product, fill the pack to its fullest and repeat the process of squeezing out air and fully submerging the pack into a container of water and record the cubic ml that is displaced from the water (this is measure B).
4. To find the headspace use the following calculation:

$$A/B \times 100 = \text{headspace \%}$$



3. Product Brim-full method

Steps to assess headspace using the brim-full method:

1. Fill the pack with product to a level where, once closed, the container is entirely full.
2. Then remove the product and calculate the volume of this product/loose material. This value is the total possible volume of the container (i.e. the 'brim-full volume').
3. Then fill another pack with the volume of the product that you (plan to) sell. This is the 'actual volume'.
4. You can then calculate the % of headspace using the following equation:

$$\frac{\text{brim-full volume} - \text{actual volume}}{\text{brim-full volume}} \times 100 = \% \text{ Headspace}$$



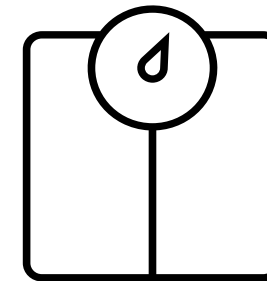
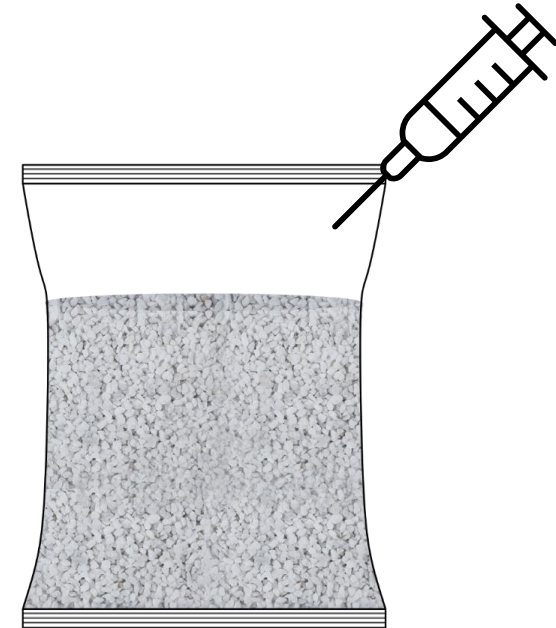
This method is easier to use with loose product (e.g. unwrapped sweets, rice) and liquids (e.g. yoghurt, shampoo). In the case of solid products, filling the container to the brim with product, will probably involve 1 product + fraction of product. Please see chocolate bar example: 1 full bar + ~20% of a chocolate bar = brim-full filling.



4. Synringe brim-full method

1. Fill the packaging with product to the grammage you plan to sell (take pack from the line). Weigh this pack. This is measurement A.
2. Then, using a syringe, fill the closed pack with water until the pack is full. You don't need to fill the pack to bursting – you can pierce a small hole in the top of the pack and when drops of water start to come out of the pierced hole, you will know that it is full. Weigh the pack that is now filled with product and water. This is measurement B.
3. Using these measurements, calculate the void ratio* using the following equation:

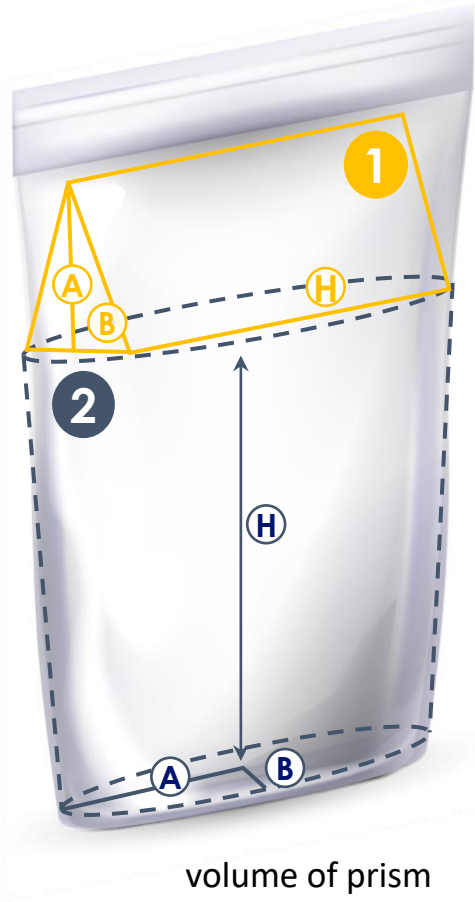
$$\frac{B-A}{B} = \% \text{ Void Ratio}$$



*This measures the void in the pack (i.e. all of the empty space in the pack, including the gaps between products and the functional headspace). This figure is different to calculating headspace % and the number is likely to be higher. Therefore, you must set different targets for your packs if you are choosing to calculate void rather than headspace.

5. Geometric method

These are examples of the way the geometric methodology can be used to calculate headspace in different pack types. The type of pack you are measuring will dictate which geometric shapes you should be using to calculate headspace. It is key to use different shapes for different parts of the pack to get as accurate a result as possible, including to account for any functional additions (e.g. pouring spout).



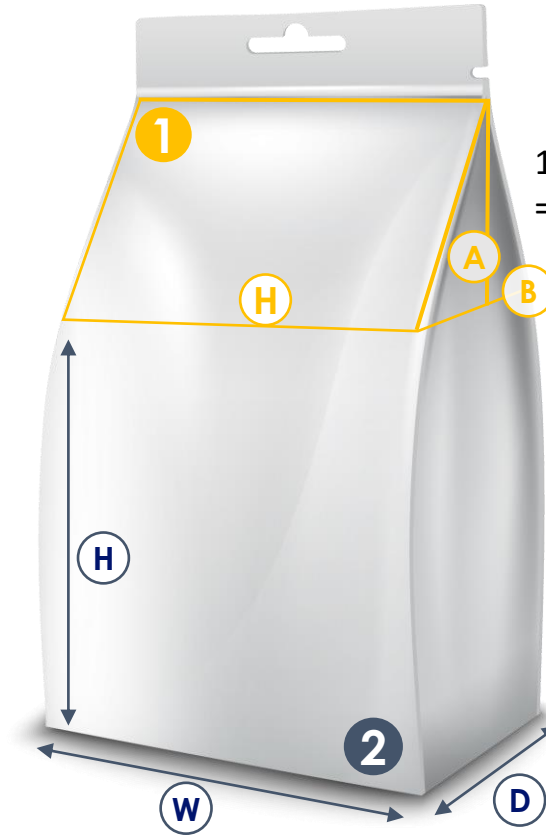
1. Volume of Prism
 $= 1/2A*B*H$

2. Volume of Elliptical
 Cylinder
 $= \pi ABH$

volume of prism

x 100 = % Headspace

volume of prism + volume of elliptical cylinder



1. Volume of Prism
 $= 1/2A*B*H$

2. Volume of Cuboid
 $= D*W*H$

volume of prism

x 100 = % Headspace

volume of prism + volume of cuboid

Rule 3: FAQ



Question	Answer
<p>Would the 30% headspace be applied to all packs, or be a portfolio average ?</p>	<ul style="list-style-type: none"> The rule is applicable to each individual product (not individual pack) such that the product's average measurement does not exceed 30%. This way, seasonal variability of the product is considered.
<p>When and where in the production process should headspace be measured?</p>	<ul style="list-style-type: none"> Headspace should be measured after filling (on the production line
<p>How often should headspace be measured?</p>	<ul style="list-style-type: none"> Companies can decide what makes most sense for their portfolio. For some companies, this measurement might happen only in the development stage of the product. For others who need to take seasonal variability into account, they may choose to measure throughout the year at a frequency they deem appropriate.



Golden Design Rule 4

Commitment*: Reduce plastic overwraps

Reduce plastic overwraps by only using them when “necessary” (as defined by the developed guideline)

A

Eliminate problematic or unnecessary packaging

* These are voluntary independent commitments by individual companies

4

Rule 4: Reduce plastic overwraps



Reduce Excess packaging¹	<ul style="list-style-type: none"> • Reduce plastic overwraps by only using them when “necessary” (as defined by the developed guideline²)
Rationale	<ul style="list-style-type: none"> • Could avoid 2 million tonnes of virgin plastic (220M full shopping trolleys) and \$5.1 billion in material costs and EPR fees²
Scope of application	<ul style="list-style-type: none"> • Across all packaging • Definition of ‘overwrap’: packaging without a barrier function holding separately packed items together as a multi-pack. • Plastic store bags are out of scope
Product category examples³	<ul style="list-style-type: none"> • Food: <ul style="list-style-type: none"> • Confectionary • Crisps and snacks • Canned and tinned foods • Beverages • Non-food <ul style="list-style-type: none"> • Home care • Personal Care • Baby care
Exceptions⁴	<ul style="list-style-type: none"> • No specific exceptions
Company commitments	<ul style="list-style-type: none"> • Make a public commitment to implement by 2025 • Use guideline to identify where necessary overwraps are used. Redesign to remove overwraps where not deemed necessary • Report transparently on which overwraps you have deemed “necessary” and on the implementation progress by reporting on the removal of “unnecessary” packaging (through the reporting template for the Global Commitment to a New Plastics Economy, or aligned to the Global Commitment reporting cycle if you are not)

4

Rule 4: Reduce plastic overwraps by only using them when “necessary”



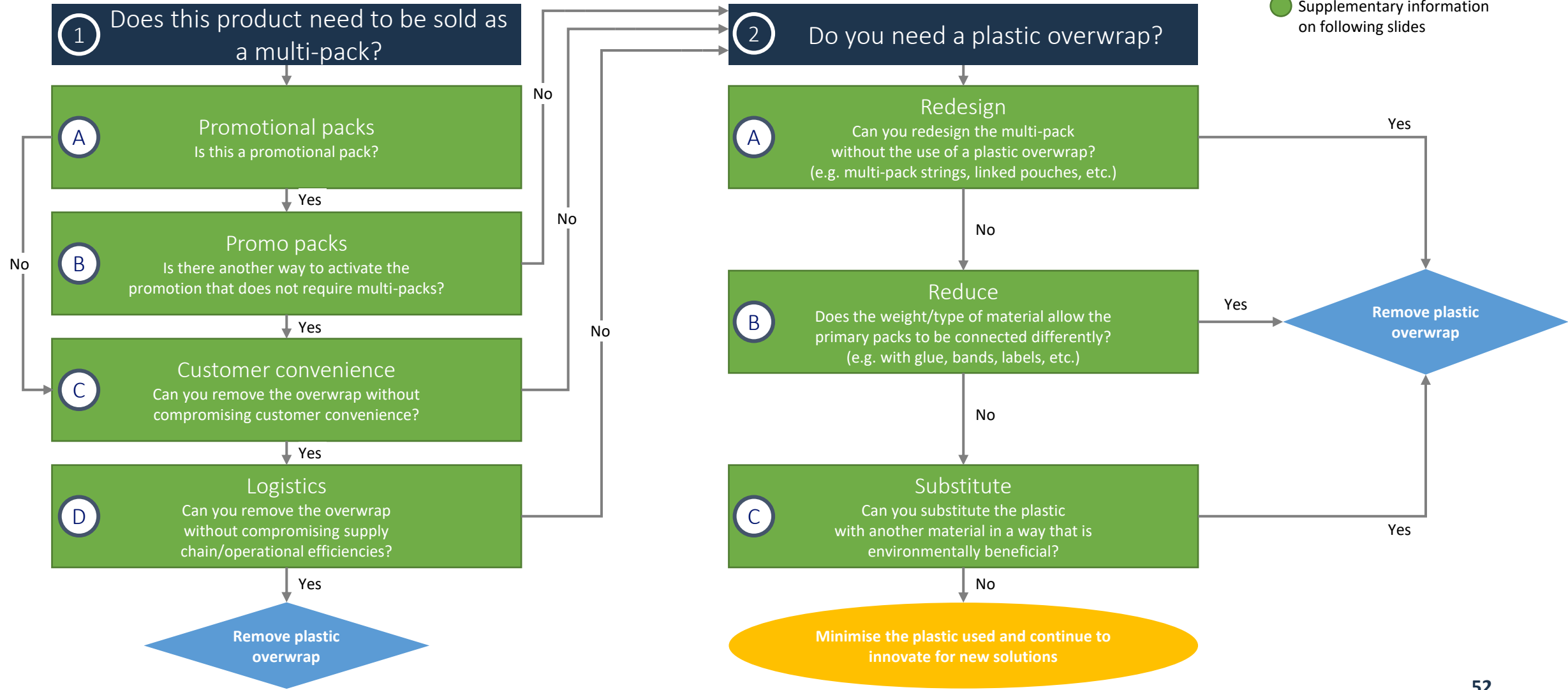
Rationale	<ul style="list-style-type: none"> • Many companies have committed to removing unnecessary plastic packaging, but guidelines to specify what plastic is unnecessary are needed • Members unanimously indicated there is an opportunity to reduce plastic overwraps¹
Benefits to system	<ul style="list-style-type: none"> • By removing unnecessary overwraps, companies reduce the demand for virgin plastic and reduce the absolute amount of plastic being placed on to the market
Benefits to brand/retailers	<ul style="list-style-type: none"> • Through NPEC commitments, signatories have committed to eliminate unnecessary packaging • Reducing the amount of flexible packaging used helps businesses fulfil voluntary reduction / elimination targets

4

Rule 4: Guideline developed to help members define when overwraps are "necessary"



Supplementary information on following slides



Note: 1) The objective is to reduce the number of plastic overwraps and signatories are encouraged to focus here rather than on light-weighting; 2) The removal of the overwrap should not be detrimental to the recyclability of the primary pack or lead to an increase in overall plastic volume; 3) "Customer" includes both consumers as well as retailers (e.g. club stores); 4) All packaging solutions considered should be proven to be environmentally beneficial compared to the status quo option

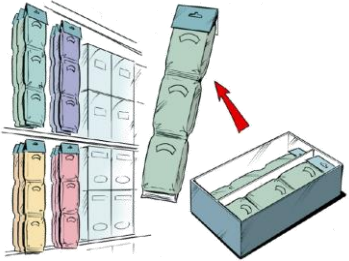
4

Rule 4: Do you need a plastic overwrap?



Ⓐ Can you redesign? (alternative designs that could eliminate plastic overwraps)

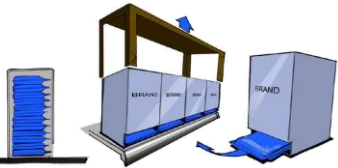
Multipack string



A string of pouches with minimal card header can be displayed on euro-hooks or shelf ready packaging (SRP)

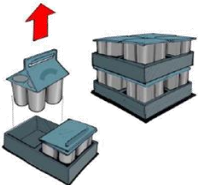
- Minimal collation packaging
- Consumer can mix-and-match to prevent food waste from unwanted flavours
- Retailer can offer promotions (e.g. 4 x 3-packs the same price as 12 pack)

Protective retail ready packaging



- Lightweight pouches presented in reusable point of sale display or SRP, which performs structural function during transit.

Carton carry handle



- A pop-up carton carrying handle and promotion surface collates the cans at the top.


4

Rule 4: Do you need a plastic overwrap?




B Can you reduce? (alternative solutions that could eliminate plastic overwraps)¹

Glue dots



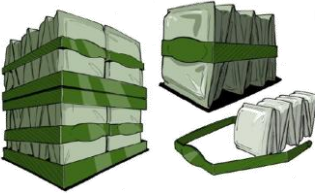
- Glue dots can be used to connect packs of cans and PET beverage bottles

Labels




- A pair of labels on each side of the packs can replace an outer bag to connect multiple product pouches

Bands



- Linked, perforated pouches create a self standing multipack unit, which requires minimal collation packaging (e.g., band) Used in conjunction with SRP tray for transit and display¹

Multipack triangles



- A three-pouch multipack collated into a freestanding presentation using a band (top) or a gable (bottom). Shelf ready packaging self presents the packs while optimising volumetric footprint¹

C Can you substitute? (alternative solutions that could eliminate plastic overwraps)

Example: Substitution of shrink wraps on can multipacks

- Where they offer an environmentally net-beneficial solution, shrink wraps on can multipacks can be substituted with, e.g., cardboard 'clips' or cartons

Note: 1) All packaging solutions considered should be proven to be environmentally beneficial compared to the status quo option

4

Rule 4: FAQ



Question	Answer
Does the packaging holding together individual wrapped candies qualify as an overwrap or flexibles?	<ul style="list-style-type: none">• Flexible plastic packaging holding together small individually wrapped products qualifies as both flexibles (in scope GDR6) and an overwrap (possibly in scope for GDR4)• The rules are not mutually exclusive: one relates to material, the other to function.• Packaging should be assessed against the GDR4 criteria for ‘necessary overwraps’ in the GDR Factpack to confirm whether the overwrap is deemed ‘necessary’

Golden Design Rule 5

Commitment*: Increase recycling value for PET thermoformed trays and other PET thermoformed packaging



C Increase recycling value in future recycling system(s) for packaging types not recycled at scale today¹

For PET thermoformed trays and other PET thermoformed packaging:

1. Regional design guidelines to fit with existing recycling programs¹ shall be met wherever possible.
2. For packaging that is not accepted by existing recycling programs, and where there is a clear pathway for a future recycling system by 2025², but currently no detailed regional guidelines exist the following requirements apply:
 - a) Use transparent and uncoloured (preferred), or transparent blue or green PET³
 - b) Ensure material choice, adhesive choice, inks and size of sleeve or label is not problematic for recycling⁴
 - c) Use only mono-material PET⁵
 - d) Use minimal or moderate direct printing⁶
 - e) Ensure material choice and adhesive choice of lidding films, inserts or other components is not problematic for recycling⁷

¹Recycling programs are at different stages of development in different regions, so companies are recommended to check regional advice or guidelines such as those provided by APR in the US and RecyClass in Europe. Signatories should use the exceptions reporting process to record cases where they have followed regional design guidelines instead of the Golden Design Rules.

²As accepted by industry associations and multi-stakeholder value-chain initiatives such as RecyClass/PetCore and Plastics Pacts and targeting recycling rates of >30%.

³With an L-value of 40; Do not use fillers that affect clarity; coatings should not lead to misdetection of the packaging and misdirection to waste.

⁴Including phase out of paper labels and PETG, PVC and PLA labels/sleeves, and non-water soluble/dispersible adhesives.

. Labels/sleeves should not lead to misdetection of the packaging and misdirection to waste.

⁵Including minimum 95% PET content with an intrinsic viscosity that is suitable for the recycling program in region. Do not use materials that have a negative impact on rPET clarity.

⁶E.g. production date or expiry date; Where additional printing is necessary, use of labels or direct printing methods which do not limit recyclability (as per local industry guidance) is preferred. If this is not possible, use only inks that do not bleed.

⁷Lidding films, inserts and other components should not lead to the misdetection of the main packaging, and if using non-PET polymers, density should be <1g/cm³.

• These are voluntary independent commitments by individual companies

Note: where regional guidelines provide more detailed guidance and indicate compatibility with recycling process, please follow those (e.g. APR in the US and RecyClass in Europe)

Rule 5: Increase recycling value for PET thermoformed trays and other PET thermoformed packaging



Rationale	<ul style="list-style-type: none"> • If adopted industry-wide, a rule on PET trays and other thermoformed PET packaging would affect >3% of the total plastic packaging market, which is set to grow as the use of PET for trays increases^{1, 2} • PET trays are not currently recycled at scale but solutions are being scaled-up in Europe and North America – a rule to increase recyclability would provide a boost to emerging recycling infrastructure and increase the quantity and availability of rPET which is necessary to meet targets around recycled content³ • The rule is aligned with published retailer guidelines and third-party guidelines such as APR, RecyClass / PetCore and WRAP
Scope of application	<ul style="list-style-type: none"> • All thermoformed PET trays and all other thermoformed PET packaging, including blister packs and clamshells
Exceptions⁴	<ul style="list-style-type: none"> • Except where health and safety regulation requires a component that does not meet the rule requirements, for which there is no alternative • Colours may be used where absolutely necessary to maximize recycled content • Where barrier protections (for UV light, CO₂, or O₂) are required for product shelf life and other solutions (e.g., full-body sleeves) are not possible
Company commitments	<ul style="list-style-type: none"> • Make a public commitment to implement by 2025 • Integrate into relevant packaging specifications and apply to all packaging renovations and innovations by 2025 • Optional: conduct own internal audits / spot checks to validate implementation • Report transparently on progress to implementation (through the reporting template for the Global Commitment to a New Plastics Economy, or aligned to the Global Commitment reporting cycle if you are not)

“

“The different polymers in multi-material multi-layer trays cannot currently be cost-effectively separated and recycled, and are detrimental to the quality of rPET derived from other product groups.”

– PET market in Europe: State of play (Plastics Recyclers Europe, 2020)

“Some PET Pots, Tubs and Trays are pigmented which greatly limits the end markets for the recycled materials and reduce the clarity of the clear PET. White PET is especially problematic”

– Recycling industry expert

”

“

“The primary aim should be to use clear; the use of colour should be a solution for recycled applications only.”

– Recycling industry expert

“There is significant unmet demand from thermoform recyclers for feedstock and for thermoform-only bales to improve the economics of recycling”

– North America expert

“PET tray reprocessing capacity in the EU28 is less well developed than bottle reprocessing capacity, but ... this market area is growing”

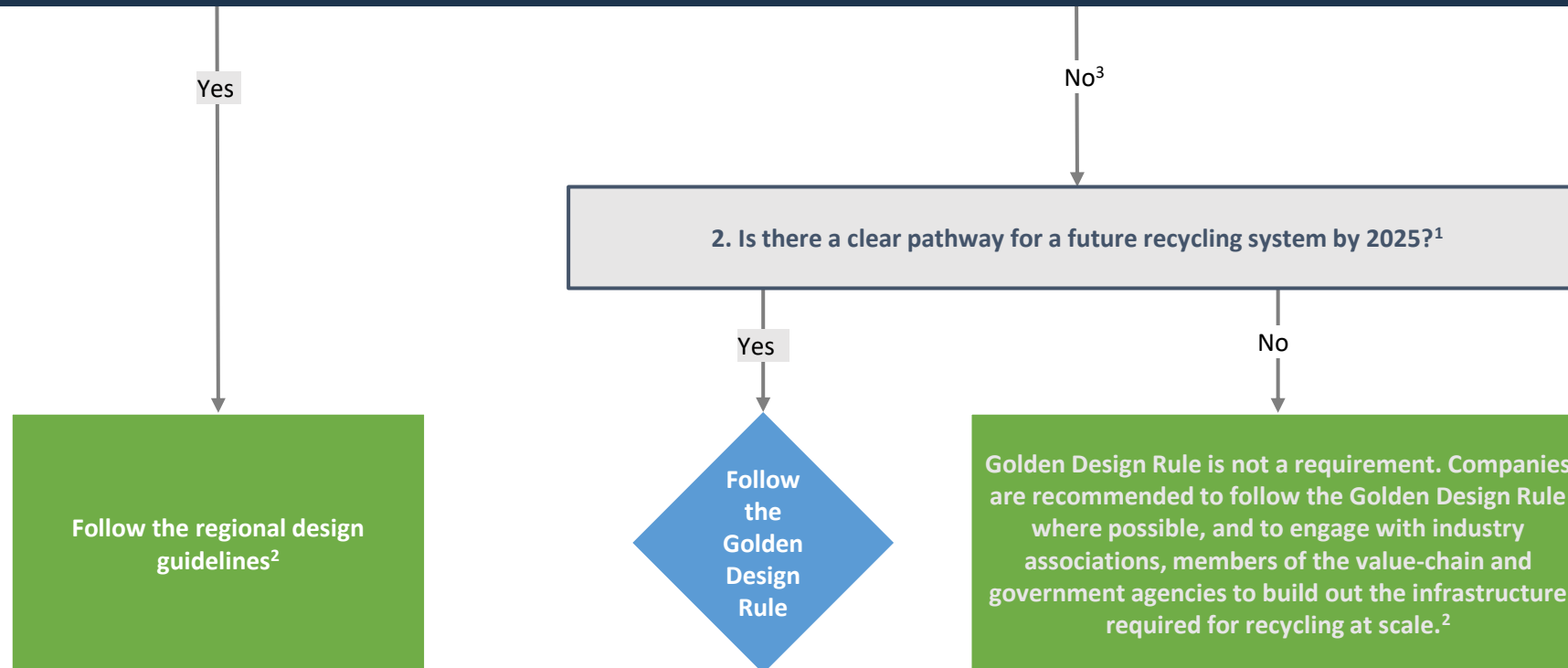
– PET market in Europe: State of play (Plastics Recyclers Europe, 2020)

”

Rule 5: Guideline developed to help members understand when the Golden Design Rule should be followed



1. Are there regional design guidelines for pet thermoformed trays and other pet thermoformed packaging to fit with existing recycling programs and is it possible to follow these guidelines (for example APR guidelines in the US and RecyClass guidelines in Europe)?



¹ As accepted by industry associations and multi-stakeholder value-chain initiatives such as PetCore and Plastics Pacts and targeting recycling rates of > 30%.

² Signatories should use the exceptions reporting process to record cases where they have not followed the Golden Design Rule, e.g. following regional design guidelines instead

³ If detailed guidelines are developed in the future based on the sorting and recycling technology, please use these to inform the changes you make to your packaging.

Rule 5: FAQ 1/3



Question	Answer
Does this rule assume that PET trays will be recycled through tray-to-tray recycling or tray-to-bottle recycling?	<ul style="list-style-type: none"> Trays and other thermoformed PET packaging are currently recycled in both tray-to-tray streams and in tray-to bottle streams. Therefore, the rule is designed to support both pathways. The design elements set out in the rule will increase value in recycling for both streams.
What is an L-Value?	<p>L-value is a measure of 'lightness' on the colour scale from black (0) to white (100) – this does not relate to the transparency of the bottle. L- Value is an additional requirement to ensure the resulting rPET has higher value due to its clear ('colorless') appearance.</p> <p>All colours with an L-value of less than 40 (or a NIR reflectance $\leq 10\%$) require testing to determine the appropriate APR recyclability category. To evaluate the sorting potential of a plastic article, please refer to APR's benchmark test '<i>Evaluation of the Near Infrared (NIR) Sorting Potential of a Whole Plastic Article</i>'</p>
Why is transparent and uncoloured PET preferred?	<ul style="list-style-type: none"> Clear and transparent PET are "preferred" to blue or green as they provide the greatest opportunity for the packaging to be recycled back into new high-value products, which will in turn increase the supply of rPET.
Why can I not use other light-colours?	<ul style="list-style-type: none"> The path for other colours leads predominately to open-loop recycling into lower value products.

Rule 5: FAQ 2/3



Question	Answer
<p>Why should I use only mono-material PET?</p>	<ul style="list-style-type: none"> Multi-material PET is harder to recycle efficiently, and the presence of other materials can disrupt and contaminate the recycling stream, resulting in a lower value recyclate. PE for example is a contaminant in PE.T packaging: PET recycled with PE contamination becomes cloudy/yellowed. Using only mono-material PET for trays and other thermoformed products also allows the packaging products to be recycled in both bottle streams and tray-tray streams depending on the recycling system that is in place in the market where the packaging is sold.
<p>Why are colours acceptable if they are necessary to maximize recycled content?</p>	<ul style="list-style-type: none"> In some cases the use of pigment may be required to maximize recycled content because recycled PET can be discoloured or hazy, and so unsuitable for certain applications. In parts of Europe, there are also a small number of recyclers who have established dedicated coloured tray-tray recycling streams, however these are still operating at a small-scale. Colour should only be used if it is essential to maximize the use of recycled content.
<p>What is the definition of minimal or moderate printing?</p>	<ul style="list-style-type: none"> The objective of this rule is to increase the recycling value of the plastic. The use of labels or direct printing methods which do not limit recyclability (as per local industry guidance) is preferred where additional printing beyond basic data such as production or expiration date is required. Certain examples of approved or conditionally approved direct printing methods for PET thermoforms are listed by industry guidance: <ul style="list-style-type: none"> APR lists direct printing as preferred, provided the use of wash-off inks (i.e., designed for higher density “sinking” label films where the ink washes off in particles) Recyclass lists laser-marked direct printing as compatible If this is not possible, inks that do not bleed or which are proven not to limit recyclability should be used. We recommend following regional guidelines where these provide more detailed directions, including on the type of label.

Sources: APR [PET Design Guide](#); [REcyClass](#) tool; WRAP [Recyclable Packaging Guidelines](#); APR [Evaluation of the NIR Sorting Potential of a Whole Plastic Article](#); APR [Critical Guidance Protocol for Clear PET Resin and Molded](#) Articles; APR [Critical Guidance Protocol for Clear PET Articles with Labels and Closures](#); APR [Benchmark Evaluation for Clear PET Articles with Labels and Closures](#)

Rule 5: FAQ 3/3



Question	Answer
<p>How do I prove my ‘material choice, adhesive choice or size of sleeve does not limit the product’s recyclability’?</p>	<ul style="list-style-type: none"> • APR has multiple definitive tests covering these limits: <ul style="list-style-type: none"> ○ Materials: <i>Critical Guidance Protocol for Clear PET Resins and Molded Articles</i> ○ Adhesives: <i>New Delamination test</i> (currently under development) ○ Size of sleeve: <i>Critical Guidance Protocol for Clear PET Articles with Labels and Closures</i> ○ Labels & closures: <i>Benchmark test for Clear PET Articles with Labels and Closures</i> • Alternatively, member companies can refer to local recycling bodies like the PRE or raise any uncertainties with the panel during the exception process
<p>Do labels and additional components need to be removable by consumers?</p>	<ul style="list-style-type: none"> • The bottles should not rely on consumers to remove labels to be recyclable. Please refer to WRAP’s guideline ‘Defining What’s Recyclable’ for on-pack messaging guidance
<p>Should companies still follow the Golden Design Rule in markets where there are no regional design guidelines, but where no clear pathway to a recycling system by 2025, targeting recycling rates of >30% exists?</p>	<ul style="list-style-type: none"> • In markets where there are no regional guidelines, and where there is not a clear pathway to a recycling system by 2025 (based on the definition set out in the rule (“As accepted by industry associations and multi-stakeholder value-chain initiatives such as CEFLEX and Plastics Pacts and targeting recycling rates of > 30%”), the Golden Design Rule is not a requirement but companies are recommended to follow the Golden Design Rule where possible and to engage with industry associations, members of the value-chain and government agencies to build out the infrastructure required for recycling at scale.
<p>Why are small pack exempt?</p>	<ul style="list-style-type: none"> • ‘Small formats’ can be considered as an exception if they meet industry guidance and test criteria for sorting potential. • The waste management industry will need to find a solution to recover these items. Meanwhile, designers are encouraged to design packaging in accordance with the detailed guidelines set out by recyclers (e.g. PRE, WRAP and APR). <ul style="list-style-type: none"> • APR classifies small format as “Items smaller than 2 inches in 2 dimensions”¹, while WRAP defines them as smaller than 50 x 50 mm packaging items. Please note, this guidance can change over time in line with changes in sorting machinery. • In order to test the recyclability, please refer to guidelines such as APR’s benchmark test called ‘<i>Evaluation of Size Sorting Potential for Articles with at least 2 Dimensions Less than 2 Inches</i>’.

Golden Design Rule 6

Commitment*: Increase recycling value in flexible consumer packaging

C Increase recycling value in future recycling system(s) for packaging types not recycled at scale today¹

For flexible consumer packaging made mostly from plastic¹:

1. Regional design guidelines to fit with existing recycling programs² shall be met wherever possible.
2. For packaging that is not accepted by existing recycling programs, and where there is a clear pathway for a future recycling system by 2025³, but currently no detailed regional guidelines exist the following requirements apply:
 - a) Maximize polyolefin content:
 - Preferably >90% mono PE, or >90% mono PP
 - Minimum either >80% mono PE, >80% mono PP or >80% mixed polyolefins
 - b) Density <1 g/cm³
 - c) Each barrier layer should not exceed 5% of the total packaging structure weight ⁴
 - d) No PVC, PVDC, fibres, aluminium foil, PET

¹ 'Mostly from plastic' defined as packaging which is > 50% plastic (based on EU recognised definition of a 'predominant' material). This rule does not cover compostable plastic packaging that meets accepted certification standards for compostability.

² Recycling programs are at different stages of development in different regions, so companies are recommended to check regional advice or guidelines such as those provided by APR in the US and RecyClass in Europe. Signatories should use the exceptions reporting process to record cases where they have followed regional design guidelines instead of the Golden Design Rules.

³ As accepted by industry associations and multi-stakeholder value-chain initiatives such as CEFLEX and Plastics Pacts and targeting recycling rates of > 30%.

⁴ Only use barrier layers and barrier coatings proven not to limit the recyclability of the packaging. AlOx, SiOx, EVOH and PVOH are recommended. Excess outer metallization (as a barrier or for decoration) could lead to misdetection of the packaging and misdirection to waste.

* These are voluntary independent commitments by individual companies

6

Rule 6: Increase value in consumer flexible packaging recycling



Rationale	<ul style="list-style-type: none"> Flexible plastic packaging makes up an estimated 51% of the total plastic packaging market (68 million tonnes). Demand for flexible packaging is expected to increase with increasing demand for convenience food and online retailing¹ Consumer flexible plastic packaging is not currently recycled in practice or at scale,² however there are multiple efforts underway to improve collection, sorting and recycling systems to recycle flexible materials The proposed design changes would increase value in recycling for both mechanical and chemical recycling
Scope of application	<ul style="list-style-type: none"> All consumer flexible packaging made mostly from plastic: <ul style="list-style-type: none"> 'Consumer' packaging is packaging likely to end up either in the household waste stream or disposed of by consumers during consumption outside the home 'Flexible' packaging is packaging that does not keep its shape when moved or emptied³ 'Made mostly from plastic' defined as packaging made from >50% plastic (i.e. where plastic is the predominant material) Plastic store bags are out of scope
Exceptions	<ul style="list-style-type: none"> TBC based on expert / workstream feedback
Company commitments	<ul style="list-style-type: none"> Make a public commitment to implement by 2025 Integrate into relevant packaging specifications and apply to all packaging renovations and innovations by 2025 Optional: conduct own internal audits / spot checks to validate implementation Report transparently on progress to implementation (through the reporting template for the Global Commitment to a New Plastics Economy, or aligned to the Global Commitment reporting cycle if you are not)

¹ Flexibles market in Europe: State of play (PRE, 2020) ² [Recycling Rate Survey Summary Results \(2020\)](#), EMF; ³ Plastic Recyclers Europe; ⁴ Exceptions will be reported by companies annually in alignment with the exceptions protocol that applies to all Design Rules

6

Expert Perspectives and Quotes from the Literature on Flexible Plastics



“The recycling of PE flexible films within Europe has the potential to more than triple in size over the next decade, if collection and recycling rates can be raised towards target recycling rates or overall plastic packaging”

– *Flexibles market in Europe: State of play (PRE, 2020)*

“Widespread adoption and implementation of the [CEFLEX] guidelines is essential to support establishing collection, sorting, and recycling systems for flexible packaging”

– *Graham Houlder, CEFLEX*

“To make it easier to recycle flexible plastic packaging, customers will be able to put their PP plastics into the same recycling bins currently provided in Sainsbury’s stores that collect PE plastics”

– *Sainsbury initiative for in-store consumer PP recycling (launched 2021)*



“The MRFF (Materials Recovery for the Future) Industry collaborative research demonstrates that ... with adequate optical sorting capacity and peripherals, flexible plastic packaging [in the US] can be efficiently captured in a large single-stream MRF and processed ... for reuse in a variety of markets while diverting plastic from landfills”

– *Materials Recovery for the Future*

“The key quality challenges [for increasing recycling of flexible packaging] are therefore to reduce the diversity of polymers used for flexible films, avoid imports of PVC flexible packaging, avoid multi-material, multi-layer flexible packaging, [and] reduce the use of pigments, problematic adhesives, inks, fillers”

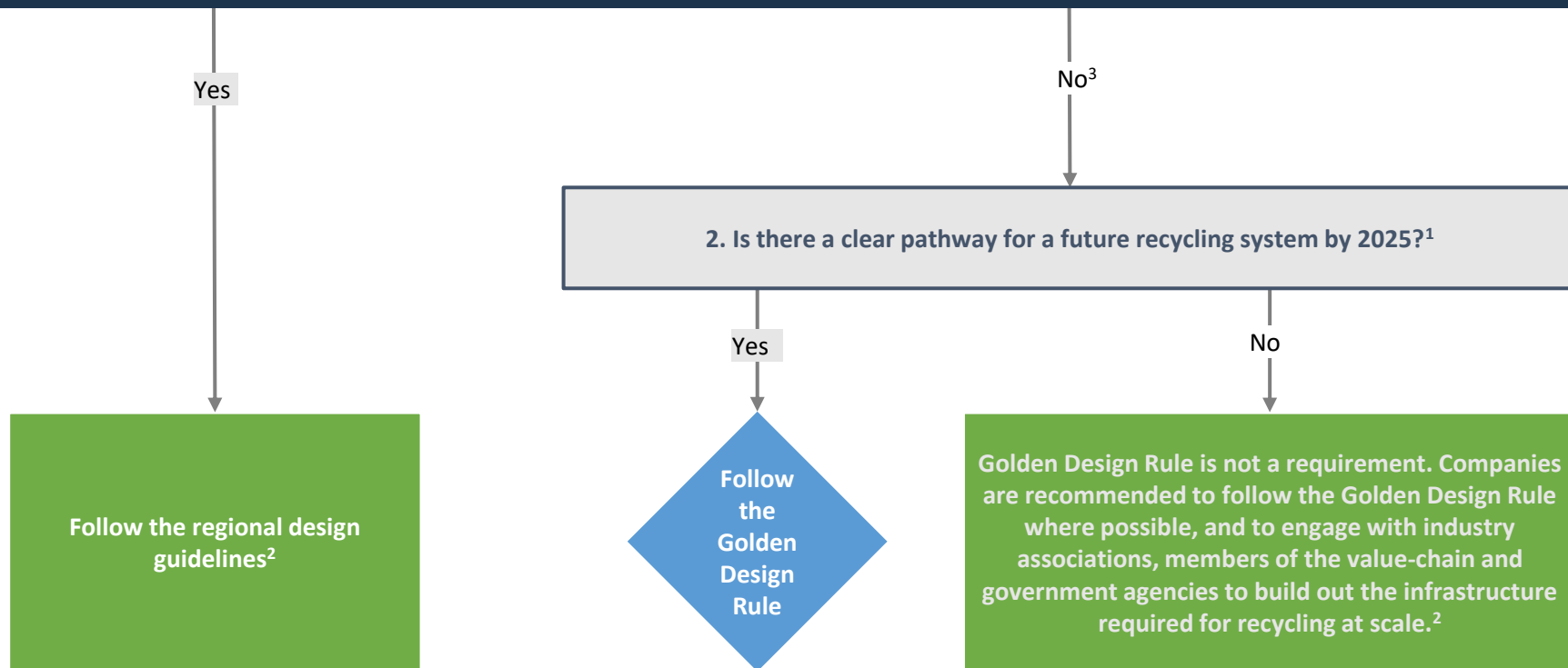
– *Flexibles market in Europe: State of play (PRE, 2020)*



Rule 6: Guideline developed to help members understand when the Golden Design Rule should be followed



1. Are there regional design guidelines for flexible consumer packaging to fit with existing recycling programs (for example APR guidelines in the US and RecyClass guidelines in Europe)?



¹ As accepted by industry associations and multi-stakeholder value-chain initiatives such as CEFLEX and Plastics Pacts and targeting recycling rates of > 30%.

² Signatories should use the exceptions reporting process to record cases where they have not followed the Golden Design Rule, e.g. following regional design guidelines instead

³ If detailed guidelines are developed in the future based on the sorting and recycling technology, please use these to inform the changes you make to your packaging.

Rule 6: FAQ 1/2



Question	Answer
<p>Should companies still follow the Golden Design Rule in markets where there are no regional design guidelines, but where no clear pathway to a recycling system by 2025, targeting recycling rates of >30% exists?</p>	<ul style="list-style-type: none"> In markets where there are no regional guidelines, and where there is not a clear pathway to a recycling system by 2025 (based on the definition set out in the rule (“As accepted by industry associations and multi-stakeholder value-chain initiatives such as CEFLEX and Plastics Pacts and targeting recycling rates of > 30%”), the Golden Design Rule is not a requirement but companies are recommended to follow the Golden Design Rule where possible and to engage with industry associations, members of the value-chain and government agencies to build out the infrastructure required for recycling at scale.
<p>In a market where regional design guidelines say that a particular type of flexible consumer packaging is not accepted for recycling, does that mean that I can no longer use it in that market?</p>	<ul style="list-style-type: none"> The rule says “Regional design guidelines to fit with existing recycling programs² shall be met wherever possible.” If it is not possible to follow the guidelines and if there is a clear pathway to a future recycling system for this type of flexible consumer packaging by 2025, the Golden Design Rule applies.
<p>Is this rule developed according to the needs of mechanical recycling or chemical recycling?</p>	<ul style="list-style-type: none"> The rule is based primarily on the design elements that would positively impact recyclability of flexibles in mechanical recycling, however, however many of these design elements would also increase the suitability of the packaging as feedstock for relevant chemical recycling technologies (for example, increasing the share of PE and PP would improve the chemical recycling yield)
<p>What is meant by “compostable packaging that meets accepted certification standards for compostability”?</p>	<ul style="list-style-type: none"> Packaging that is in compliance with relevant international compostability standards (including ISO 18606, ISO 14021, EN13432, ASTM D-6400 and AS4736). Independent certification schemes exist which offer product assessment and certification services based on these standards. See the New Plastics Economy Global Commitment Definitions guidance document for more information.

Rule 6: FAQ 2/2



Question	Answer
Why is PET film eliminated?	<ul style="list-style-type: none"> PET is not compatible with a PE, PP or mixed polyolefin mechanical recycling process.
What is the difference between the use of metal (e.g. aluminium) and metallization?	<ul style="list-style-type: none"> Packaging that includes metal foil e.g. aluminium will typically be sorted out of the flexible plastic packaging recycling stream and the plastic fraction will not be recycled. This includes laminated plastic-based structures containing a thin layer of aluminium foil, which is used for its high barrier function but is undesirable in the plastic recycling process. Flexible packaging structures with metallisation are notably different to structures containing aluminium foil. Metallisation is a vapour deposition process which deposits a very thin layer of aluminium on the surface of a plastic film. This thin layer has a thickness of approximately 0.02 – 0.5 micron and provides a range of functional properties including oxygen, moisture and aroma barriers as well as light protection. Metallisation can be a layer within a laminated structure or on the surface of a packaging structure. Laminated and printed metallised flexible packaging structures do not cause any sortability issues. The NIR is not affected as the reflective layer is within a laminated structure and can therefore not be seen. Metallisation is not regarded as a disruptor to the plastics mechanical recycling process as the layer of metallisation is too thin to be significant. However, structures that have surface metallisation may result in sortability issues depending on the level of metallisation and printing due to the reflection disrupting NIR optical sorting processes.
Does the packaging holding together individual wrapped candies qualify as an overwrap or flexibles?	<ul style="list-style-type: none"> Flexible plastic packaging holding together small individually wrapped products qualifies as both flexibles (in scope GDR6) and an overwrap (possibly in scope for GDR4) The rules are not mutually exclusive: one relates to material, the other to function. Packaging should be assessed against the GDR4 criteria for ‘necessary overwraps’ in the GDR Factpack to confirm whether the overwrap is deemed ‘necessary’



Golden Design Rule 7

Commitment*: Increase recycling value in rigid HDPE and PP

B Increase recycling value for packaging types that are recycled at scale in today's recycling system

For all rigid HDPE and PP packaging:

- a) For all labels, ensure material choice, adhesive choice, inks and size is not problematic for recycling ¹
- b) Use minimal or moderate direct printing ²
- c) For closures, ensure material choice, liners and seals are not problematic for recycling ³
- d) Do not use fillers that increase the density of the packaging to $>1\text{g/cm}^3$

¹ Including phase out of paper labels, and PET, PETG, PLA and PVC labels/sleeves, unless proven not to be detrimental to recycling process and align with local industry guidance; and non-water soluble/dispersible adhesives, unless proven not to be detrimental to recycling process and align with local industry guidance. Labels/sleeves should not lead to misdetection of the packaging and misdirection to waste. For in-mould labelling use only polyolefins.

² E.g. production or expiry date. Where additional printing is necessary, use of labels or direct printing methods which do not limit recyclability (as per local industry guidance) is preferred. If this is not possible, use only inks that do not bleed or which are proven not to limit recyclability.

³ Including phase out of silicone valves, and PVC and silicone seals; PS and PVC; and steel and aluminium caps. Closures should not lead to the misdetection of the packaging and misdirection to waste.

Note: where regional guidelines provide more detailed guidance and indicate compatibility with recycling process, please follow those (e.g. APR in the US and RecyClass in Europe)

7

Rule 7: Increase value in rigid HDPE and PP recycling



Rationale	<ul style="list-style-type: none"> • If adopted industry-wide, this rule would affect 20% of the total plastic packaging market¹ • Rigid HDPE and PP packaging is recycled in practice and at scale in many markets,² for example the recycling rates for consumer HDPE and PP in the EU are 64% and 42% respectively but there is significant scope for increasing value in recycling and increasing availability and quantity of recycled material³
Scope of application	<ul style="list-style-type: none"> • All rigid HDPE and PP packaging, including bottles and squeeze tubes.⁴ Rigid packaging is defined as packaging that keeps its shape when moved or emptied.
Exceptions⁵	<ul style="list-style-type: none"> • TBC based on expert / workstream feedback
Company commitments	<ul style="list-style-type: none"> • Make a public commitment to implement by 2025 • Integrate into relevant packaging specifications and apply to all packaging renovations and innovations by 2025 • Optional: conduct own internal audits / spot checks to validate implementation • Report transparently on progress to implementation (through the reporting template for the Global Commitment to a New Plastics Economy, or aligned to the Global Commitment reporting cycle if you are not)

¹ EMF New Plastics Economy Global Commitment Progress Report 2020 ² [Recycling Rate Survey Summary Results \(EMF 2020\)](#); ³ Rigid polyolefin market in Europe: State of play (Plastics Recyclers Europe, 2020); ⁴ As a packaging type, tubes do not generate enough material by weight to be consolidated. Tubes are defined as having a semi-flexible body and rigid shoulder and cap. For more information on designing tubes for recycling in the rigid HDPE/PP stream, consult the [APR guidance](#) document ⁵ Exceptions will be reported by companies annually in alignment with the exceptions protocol that applies to all Design Rules

“

“It is important to ensure that the quality of HDPE and PP recyclate can improve in a cost effective way to meet the specification demands of different applications”

– *Rigid polyolefin market in Europe: State of play (Plastics Recyclers Europe, 2020)*

“Ensuring a product is readily recyclable requires more than simply manufacturing the main product body from a technically recyclable polymer. Other features of product design (adhesives, labels, pigments) can hinder recyclability and increase the costs of producing and /or reduce the value of secondary material”

– *Rigid polyolefin market in Europe: State of play (Plastics Recyclers Europe, 2020)*

”

“

“Labels commonly do not get recycled therefore the smaller the label, the better ... Full sleeves, or sleeves that cover more than 60% of the container can lead to an identification of the material used for the container itself and can also cause quality issues”

– *WRAP ‘Design tips for making rigid plastic packaging more recyclable’*

“Of particular concern are mineral fillers or additives that cause the overall density of the blend to be greater than 1.00. The density of PP is 0.90 – 0.92 [HDPE density is 0.94 – 0.96] so it floats in water. Density is an important property as reclaimers typically rely on float – sink tanks to separate polymers and to remove contaminants”

– *APR Design Guide*

”

Rule 7: FAQ (1/2)



Question	Answer
How do I prove my 'material choice, adhesive choice or size of sleeve does not limit the product's recyclability '?	<ul style="list-style-type: none"> • APR has multiple definitive tests covering these limits, see their design guide for more information • Alternatively, member companies can refer to local recycling bodies like the PRE or raise any uncertainties with the panel during the exception process
Why are paper labels not allowed ?	<ul style="list-style-type: none"> • Paper labels are detrimental to the recycling process even if using compliant water-soluble adhesives. This applies to both pulping and non-pulping fibres. • However, removable labels in paper without fiber-loss may be approved by some industry guidance (e.g., RecyClass), as they do not contaminate recycling streams and provide high-quality recyclates.
Is in-mould labelling acceptable?	<ul style="list-style-type: none"> • In-mould labelling is acceptable if a polyolefin label is used
Does my closure/label need to be removable by consumers ?	<ul style="list-style-type: none"> • Plastic packaging should not rely on consumers to remove labels or other components to be recyclable. Please refer to WRAP's guideline 'Defining What's Recyclable' for on-pack messaging guidance.
Why are squeeze tubes included in scope?	<ul style="list-style-type: none"> • As a packaging type, squeeze tubes do not generate enough material by weight to be consolidated

Rule 7: FAQ (2/2)



Question	Answer
<p>What is the definition of minimal or moderate printing?</p>	<ul style="list-style-type: none"> • The objective of this rule is to increase the recycling value of the plastic. The use of labels or direct printing methods which do not limit recyclability (as per local industry guidance) is preferred where additional printing beyond basic data such as production or expiration date is required. • Certain examples of approved or conditionally approved direct printing methods for HDPE/PP packaging are listed by industry guidance. For example, Recyclclass lists laser-marked direct printing as compatible. • If this is not possible, inks that do not bleed or which are proven not to limit recyclability should be used. We recommend following regional guidelines where these provide more detailed directions, including on the type of label.
<p>Why are small pack exempt?</p>	<ul style="list-style-type: none"> • ‘Small formats’ can be considered as an exception if they meet industry guidance and test criteria for sorting potential. • The waste management industry will need to find a solution to recover these items. Meanwhile, designers are encouraged to design packaging in accordance with the detailed guidelines set out by recyclers (e.g. PRE, WRAP and APR). <ul style="list-style-type: none"> • APR classifies small format as “Items smaller than 2 inches in 2 dimensions”¹, while WRAP defines them as smaller than 50 x 50 mm packaging items. Please note, this guidance can change over time in line with changes in sorting machinery. • In order to test the recyclability, please refer to guidelines such as APR’s benchmark test called ‘<i>Evaluation of Size Sorting Potential for Articles with at least 2 Dimensions Less than 2 Inches</i>’.



Golden Design Rule 8

Commitment*: Reduce virgin plastic use in business-to-business plastic packaging

Reduce the use of virgin plastic in business-business (B2B) plastic packaging¹ in a way that is environmentally beneficial by:

- a) Eliminating unnecessary plastic (defined as unnecessary if it can be removed without compromising supply chain/operational efficiencies)
- b) Using post-consumer recycled content (where plastic is necessary)
- c) Switching to reuse models or alternative materials

¹ The intended scope of this rule is to cover all plastic packaging that does not reach the consumer, as distinct from rule 4 on overwraps. This means all packaging all packaging that does not end up either in the household waste stream or is disposed of by consumers during consumption outside the home.

* These are voluntary independent commitments by individual companies

Rule 8: Reduce virgin plastic use in business-to-business plastic packaging



Rationale	<ul style="list-style-type: none"> • B2B packaging is estimated to make up 7-10% of the total plastic packaging market¹ • This segment of the packaging market generally does not require food-grade plastics or barrier properties so can be well suited to the use of recycled plastics or substitute materials • Reusable alternatives to single-use packaging are available (See EMF Upstream Innovation Guide for examples of reuse models for this packaging segment) • Reducing the use of virgin plastic through elimination, use of recycled content and reuse models could lead to a lower environmental impact from both a waste and GHG emissions perspective if done in an environmentally net beneficial way
Scope of application	<ul style="list-style-type: none"> • The intended scope of this rule is to cover all plastic packaging that does not reach the consumer (as distinct from rule 4 on overwraps). This means all packaging all packaging that does not end up either in the household waste stream or is disposed of by consumers during consumption outside the home. This could include, but is not limited to: <ul style="list-style-type: none"> • Packaging that is additional to the consumer packaging, and that may be used for protection and collation of individual units during storage, transport and distribution, and to display primary packs on shelf; • Transportation packaging, including pallets, slip sheets, and stretch wrap used for the shipment and distribution of goods.
Exceptions²	<ul style="list-style-type: none"> • This rule does not apply to markets and categories which have mandated reuse targets to achieve by 2030, as this will allow a full focus on converting to reuse models and avoid investing in packaging categories and formats that will be phased out in the medium term.
Company commitments	<ul style="list-style-type: none"> • Make a public commitment to implement by 2025 • Integrate into relevant packaging specifications and apply to all packaging renovations and innovations by 2025 • Optional: conduct own internal audits / spot checks to validate implementation • Report transparently on progress to implementation (through the reporting template for the Global Commitment to a New Plastics Economy, or aligned to the Global Commitment reporting cycle if you are not)

“

“[To] create an effective after-use plastics economy ... scale up the adoption of reusable packaging within business-to-business applications as a priority.”

– *The New Plastics Economy – Rethinking the future of plastics and catalysing action (EMF, 2017)*

“Reusable B2B packaging can create substantial cost savings, and if used in pooled systems across companies and industries, significant value beyond packaging”

– *The New Plastics Economy – Rethinking the future of plastics and catalysing action (EMF, 2017)*

”

“

“A wide range of business-to-business (B2B) reuse models exist. These can range from individual companies reusing their own transport packaging to industry-wide reuse systems based on interconnected operators managing a shared set of standardised, reusable packaging”

– *Upstream Innovation: A Guide to Packaging Solutions (EMF, 2020)*

”

Rule 8: FAQ



Question	Answer															
What example of markets and categories currently qualify for the exception considered ?	<ul style="list-style-type: none"> In Europe, the first draft of PPWR legislation (2024) includes a proposal to gradually phase out B2B packaging to ReUse by 2030 with category-specific targets (see table). Please note this may change in subsequent drafts of PPWR legislation. <table border="1"> <thead> <tr> <th>PPWR draft compromise on reuse quotas</th> <th>2030</th> <th>2040</th> </tr> </thead> <tbody> <tr> <td>Transport pack. – pallets, crates, pails, drums</td> <td>40%</td> <td>90%</td> </tr> <tr> <td>Transport pack. protection (e.g, wrap, straps)</td> <td>10%</td> <td>30%</td> </tr> <tr> <td>Transport pack. shipped domestically¹ (incl. wrapping)</td> <td>100%</td> <td>100%</td> </tr> <tr> <td>Grouped packaging²</td> <td>10%</td> <td>25%</td> </tr> </tbody> </table>	PPWR draft compromise on reuse quotas	2030	2040	Transport pack. – pallets, crates, pails, drums	40%	90%	Transport pack. protection (e.g, wrap, straps)	10%	30%	Transport pack. shipped domestically ¹ (incl. wrapping)	100%	100%	Grouped packaging ²	10%	25%
PPWR draft compromise on reuse quotas	2030	2040														
Transport pack. – pallets, crates, pails, drums	40%	90%														
Transport pack. protection (e.g, wrap, straps)	10%	30%														
Transport pack. shipped domestically ¹ (incl. wrapping)	100%	100%														
Grouped packaging ²	10%	25%														
The terminology used to describe the scope of this rule is different to the language my business uses for this category of packaging. How do I know what this rule means for my business?	<ul style="list-style-type: none"> Different businesses use different language to describe the packaging additional to that which goes home with the consumer and is likely to end up in the household waste stream (or is disposed of after consumption outside the home). This may be because of different norms in different markets, or dependent on the type of business. The scope provided for this rule is intended as a guide to help businesses understand what it means for them. It should not be considered exhaustive. 															
How do I know which approach is best to reduce virgin plastic, and if it is environmentally net-beneficial?	<ul style="list-style-type: none"> In alignment with the waste hierarchy, companies should first consider if the packaging can be eliminated altogether. Where plastic is necessary, reuse models should be used. These are already used at scale for this segment of packaging. Where plastic is being used (both for single-use and reuse), recycled content should be maximized. As this segment of the packaging market generally does not require food-grade plastics or barrier properties so can be well suited to the use of recycled plastics or substitute materials To determine if an alternative is environmentally net-beneficial, LCA data may be necessary. Companies should look at GHG emissions impact as well as other environmental factors. 															
Where can I find examples of reuse models for B2B packaging?	<ul style="list-style-type: none"> EMF has developed a guide to reuse models, which includes examples for B2B, secondary and tertiary packaging: EMF Upstream Innovation Guide 															
Is this rule applicable to my company as we are a B2C organisation?	<ul style="list-style-type: none"> GDR 8 refers to all plastic packaging that does not reach the consumer, regardless of being a B2B or B2C organisation. This includes packaging materials you receive from your suppliers, e.g. plastics used for transportation and storage, or used for transportation between stores 															



Golden Design Rule 9

Commitment*: Use on-pack recycling instructions

Include recycling or reuse instructions on consumer plastic packaging¹

¹ Instructions should reflect the local conditions. Companies should continue to work at the local level to determine the most accurate way to reflect this in each country;

* These are voluntary independent commitments by individual companies

9

Rule 9: Include on-pack recycling or reuse instructions



Rationale	<ul style="list-style-type: none"> • A high-level, non-prescriptive rule allows companies to implement the rule according to what is possible in different markets • By reporting on this rule, progress on including instructions for recycling on packaging can be tracked • Consumers have a key role to play in ensuring packaging is sorted for the appropriate end-of-life solution; clear and accurate on-pack recycling instructions can increase the chances that this role is fulfilled • There are a growing number of initiatives developing guidelines for on-pack recycling instructions working towards a standardised and accurate way of communicating recycling and reuse instructions to consumers in different markets, for example ARL (Australia), How2Recycle (US) and OPRL (UK).
Scope of application	<ul style="list-style-type: none"> • All consumer plastic packaging: ‘Consumer’ packaging is packaging likely to end up either in the household waste stream or disposed of by consumers during consumption outside the home
Exceptions¹	<ul style="list-style-type: none"> • Exception for markets with no established (legal or voluntary) labelling scheme, or where there is evidence that the established voluntary labelling scheme is likely to change significantly or be overtaken by regulation
Company commitments	<ul style="list-style-type: none"> • Make a public commitment to implement by 2025 • Optional: conduct own internal audits / spot checks to validate implementation • Report transparently on progress to implementation (through the reporting template for the Global Commitment to a New Plastics Economy, or aligned to the Global Commitment reporting cycle if you are not)

¹ Exceptions will be reported by companies annually in alignment with the exceptions protocol that applies to all Design Rules

“

“Consumers want clear messages and language to inform their purchasing decisions, to know how to use the product responsibly and what to do at the end of its life (e.g. re-use, recycling, responsible disposal). This enables consumers to take action ... By facilitating consumers to take action, producers and retailers can reliably claim that the product’s sustainability attributes promote sustainable consumption”

– *Guidelines for Providing Product Sustainability Information (United Nations Environment Programme (UNEP) & International Trade Centre, 2017)*

“What would be the economic benefits if all plastic packaging had common labelling ... aligned with standardised separation and sorting systems?”

– *New Plastics Economy: Rethinking the Future of Plastics & Catalysing Action (2017)*

”

“

“The next two years will be pivotal for breaking the trend and implementing a first horizon of change that will allow key milestones to be met by 2025, including ... incentivizing consumers [and] improving labelling”

– *Breaking the Plastic Wave (Pew Trusts & SYSTEMIQ, 2020)*

“Retailers can act as pioneers by replacing existing confusing symbols with standardised icons on their own products to drive the recovery of recyclable material, through their consumers”

– *Consumers International & UNEP (2021)*

”

Question	Answer
<p>Why is there an exception for this rule in markets with no established (legal or voluntary) labelling scheme, or where there is evidence that the established voluntary labelling scheme is likely to change significantly or be overtaken by regulation?</p>	<p>This exception recognizes the importance of consumer guidance to improve recycling, while helping implementing companies to:</p> <ul style="list-style-type: none"> • Comply with existing local regulations or voluntary labeling schemes for guidance. • Ensure continued appropriate action while avoiding improper labeling. • Allow flexibility to avoid costly packaging reconfiguration due to changing legal or voluntary guidance.
<p>What recycling or reuse instructions are expected for compliance with this rule? How can I include recycling or reuse instructions when the collection and recycling systems varies across the different markets where my products are sold?</p>	<ul style="list-style-type: none"> • The rule intentionally avoids setting out prescriptive criteria on what to include in recycling or reuse instructions. On-pack recycling or reuse instructions are considered by many as an essential part of increasing collection for recycling rates, but the best way to communicate these to consumers varies from market to market. There is a growing number of local initiatives working to develop standardised approaches to recycling or reuse instructions on packaging in a way that is aligned to the collection and recycling system in the chosen market. • This Golden Design Rule is designed to allow for flexibility in complying with such initiatives – companies should continue to engage at the local level to determine the best way to implement this rule in different markets.
<p>Why is the Golden Design Rule not more specific on recommending a particular labelling approach or scheme?</p>	<ul style="list-style-type: none"> • The Golden Design Rule does not recommend a specific labelling approach because the best solution in one market is not necessarily appropriate in others. • A specific scheme is not recommended because the landscape of initiatives working on the topic is ever evolving, and companies should leverage their local expertise to determine the best scheme to align behind, should this be the most appropriate way forward.



Appendix

Reporting: The CGF will draw on experts from across geographies for input on the reporting process and exceptions raised



	Organisation name	Country/region
Recycling Organisations¹	<ul style="list-style-type: none"> • Australian Packaging Covenant Organisation (APCO) • Association of Plastics Recyclers (APR) • China Plastics Reuse and Recycling Association (CPRRA) • Crows Nest International • Plastics Recyclers Europe (PRE) • Triciclos • WRAP 	<ul style="list-style-type: none"> • Australia • US • China • Canada • Europe • LatAm • UK
Additional experts to potentially be called upon	<ul style="list-style-type: none"> • ASTA School of Business and Technology • CEFLEX • Cyclos-HTP • CITEO • Chalmers • Ellen MacArthur Foundation • Fraunhofer • Global Plastic Action Partnership • Michigan State University • The Recycling Partnership 	<ul style="list-style-type: none"> • Singapore • Europe • Germany • France • Sweden • UK • Germany • Global • US

Notes: 1) CGF / SYSTEMIQ is in contact with the recycling organisations listed here, who have all expressed interest in participating; 2) Team not yet in contact with all listed here about involvement in the panel, participation is TBC