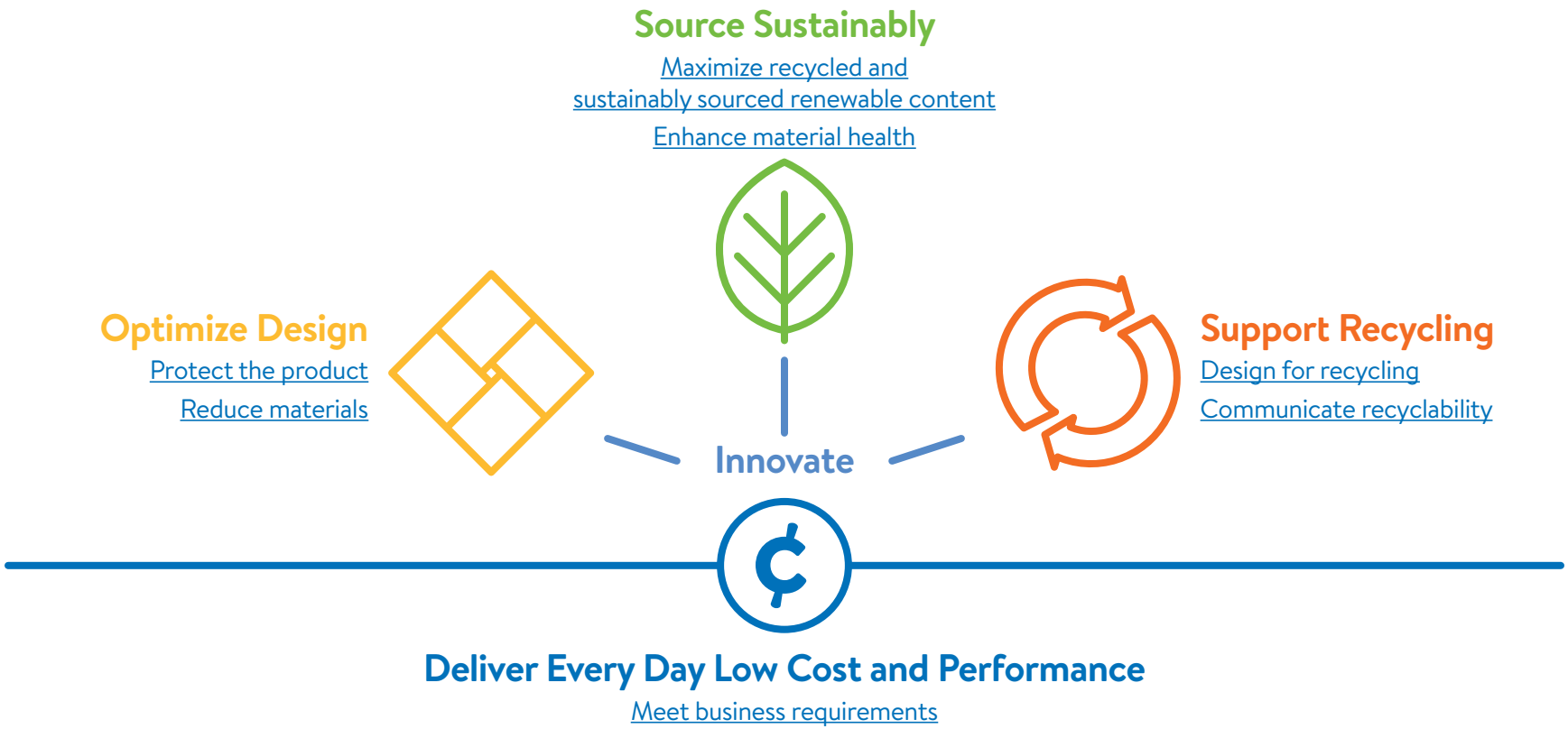
Sustainability Priorities



Walmart aims to reduce environmental and social impacts of private brand and national brand packaging, while maintaining our ability to deliver quality products to customers.

This playbook provides an overview of sustainable packaging best practices for suppliers interested in improving and innovating packaging. While the focus is on consumer-facing packaging, practices may impact or also be applied across the entire packaging system.

This playbook is not meant to replace business requirements. Rather, sustainable packaging best practices may be used to complement business needs.

Sustainability

Walmart sustainable packaging

We expect National and Private Brand suppliers to be in compliance with local, state and federal laws. We encourage our suppliers to follow these guidelines whenever possible to help reduce the environmental and social impacts of packaging materials.

Optimize design

- Eliminate unnecessary packaging, such as extra boxes, ties, or layers of packaging
- "Right size" packages—design appropriately for contents and merchandising requirements, and to prevent damage to the product
- Shift to reusable containers when possible

Source sustainably

- Increase use of recycled and sustainably sourced renewable content
- Credibly certify products sourced in accordance with our corporate commitment to zero net deforestation
- Remove/reduce/restrict use of materials that may present human health and environmental toxicity risks
- Eliminate use of biodegradable additives in petroleum-based plastics in compliance with state laws*
- Certify that packaging and packaging components are in compliance with state Toxics in Packaging laws
- Remove, reduce, or restrict all priority chemicals

Support recycling

- Increase use of recyclable content
- Ensure all recyclable/compostable/marine-degradable claims are supported with appropriate substantiation, including testing where appropriate, and meet all applicable federal, state and local requirements
- Use a consumer-friendly recycling label—SPCs How2Recycle label is preferred
- Work to improve infrastructure for hard-to-recycle packaging and products

Commitment to Every Day Low Cost (EDLC) and Performance

* Walmart U.S. and Sam's Club U.S. support elimination of the use of biodegradable additives in pertroleum-based plastics for all it's products and packaging.

Additional resources

Walmart Resources
Walmart Sustainability Hub
Walmart Retail-Ready Information

Measurement and Tracking
The Sustainability Consortium
Sustainable Packaging Coalition
COMPASS tool

Protect the Product
International Safe Transit Authority

Reduce Materials
Sustainablepackdesign.com
Sustainable Packaging Coalition

Increase Sustainable Content
Consumer Goods Forum
FTC Green Guides
Sustainablepackdesign.com
Sustainable Packaging Coalition

Enhance Material Health
Chemical Footprint Program
GreenScreen List Translator
Material IQ
National Academy of Sciences

Design for Recycling
Association of Plastic Recyclers
How2Recycle
FTC Green Guides
Sustainable Packaging Coalition

Communicate Recyclability
Association of Plastic Recyclers
How2Recycle
FTC Green Guides
Sustainable Packaging Coalition

Project Gigaton

https://www.walmartsustainabilityhub.com/project-gigaton

In 2016, Walmart set a new goal to reduce emissions in our supply chain by 1 gigaton (1 billion metric tons) by 2030. To achieve this goal, Walmart is launching Project Gigaton - An opportunity for suppliers to join Walmart in reducing greenhouse gas (GHG) emissions in the supply chain.

There are just three steps to participate in Project Gigaton:

Step One: Work within your organization to set an emissions reduction goal

Step Two: Join us so your company receives updates and recognition opportunities

Step Three: Report your company's progress each year

The goal you set is up to you - we welcome goals big, small, old and new, so please identify the right target for your organization and Join us. Each year, you'll be asked to complete a free survey that will help estimate your emissions reduction - only suppliers that have joined Project Gigaton will receive this survey and be eligible for recognition opportunities.

Walmart sustainable packaging playbook deep dive: Supporting Recycling

For companies setting recyclable packaging and recycled content goals, this document is a supplemental resource for your consideration. Information in this document is presented by packaging format (i.e., PET bottle, HDPE bottle, etc) and is focused on the most common packaging formats found in Walmart stores.

A decision tree is also provided for companies looking to determine which parts of this document to review. This document is not exhaustive for all packaging formats nor is the information intended to be prescriptive. For more general information on sustainable packaging, please refer to Walmart's Sustainable Packaging Playbook.

For each major packaging format, we have provided information which is designed to capture recyclability information based on existing infrastructure. This document also provides perspective on feasible recycled content levels based on current industry practice. We have also tried to identify design elements which can pose barriers or challenges to recycling.

Walmart encourages all suppliers to take a lifecycle perspective when seeking to optimize package design. While we want to see all of our suppliers striving to minimize material usage and advance a circular economy for plastics, it is also important to consider potential trade-offs of material choices elsewhere in the lifecycle and take those into consideration when making design choices (e.g., increased package weight impacting transportation GHG emissions, responsible sourcing of fiber based packaging, etc.)

Consider using consumer-friendly recycling labels, like the How2Recycle® label to make it easier for customers to know what they can and can't recycle.
For more information, visit: *members.how2recycle.info*

Thank you to The Association of Plastic Recyclers (APR) and the Sustainable Packaging Coalition They were key partners in the development of these Best Practices. Additional information on plastic packaging is available in the APR Design® Guide For Plastics Recyclability.

Packaging formats in the Playbook Deep Dive:

- PET Bottles
- PET Thermoforms
- PE Bags and Film
- HDPE Bottles
- Paperboard
- Corrugated Board

Packaging formats not yet in the Playbook Deep Dive, include but not limited to:

- PP and Other Plastic Packaging
- Shelf Stable or Refrigerated Cartons
- Coated Cartons
- Glass
- Blister Packages
- Multi-layer Flexible Packaging

Suppliers are reminded that they are responsible for the compliance of their products, including their products packaging, with all applicable laws and regulations, including laws and regulations applicable to recyclability and compostability, such as the FTCs Green Guides and California's Public Resources Code. Walmart does not give its suppliers legal advice. Suppliers should consult their own counsel with questions about the applicability of laws and regulations to their products and packaging.

Walmart sustainable packaging playbook deep dive: Supporting Recycling

MORE EASILY RECYCLABLE	WORKING TO BECOME RECYCLABLE	PRESENTS RECYCLING CHALLENGES
Where to start?		
Packaging materials*: • PET, PE, HDPE, and PP** • Fiber*** • Dark colored HDPE **Layers, labels, adhesives, additives, closures, caps, colors and resins can impact the recyclability of a package. Refer to the Deep Dive: Supporting Recycling documents for more details* ***For jars and tubs (not pouches)* ****Walmart encourages the use of sustainably sourced fiber (recycled content and/or certified virgin)*	• Multi-layered materials	• PVC • EPS • Polycarbonate • Degradable or Biodegradable additives • Dark colored PET

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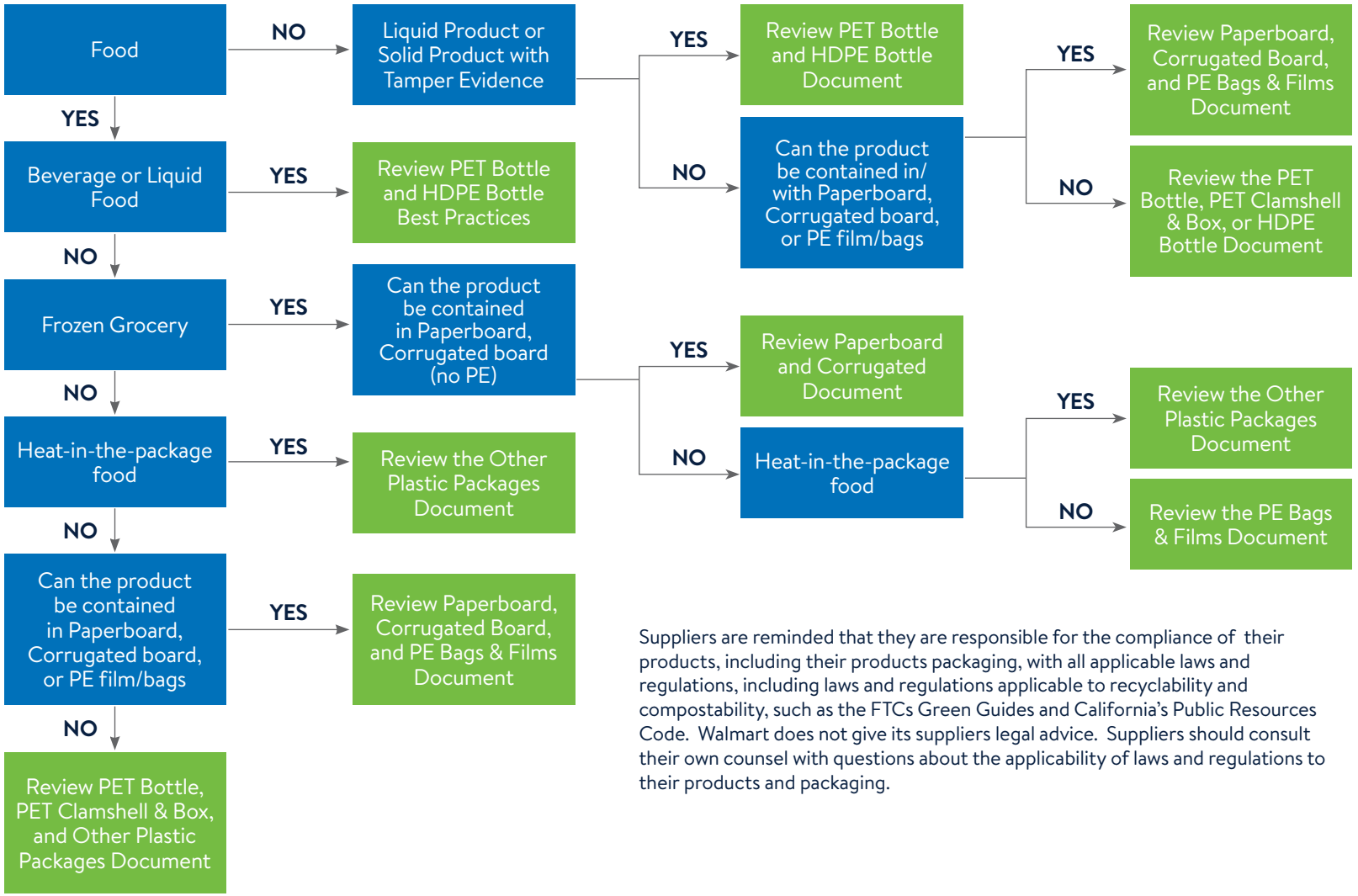
Walmart sustainable packaging playbook deep dive: Supporting Recycling

Decision tree to determine which document to review

This decision tree is provided for companies looking to determine which pages to review. This document is not exhaustive for all packaging formats nor is the information intended to be prescriptive. For each major packaging format, we have provided information which is designed to capture recyclability information based on existing infrastructure.



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Walmart sustainable packaging playbook deep dive: Supporting Recycling

PET Bottles

Application Notes

informative, not comprehensive

PET bottles is often used with the following:

- Water and beverages
- Grocery (e.g., condiments, sauces)
- Health & Wellness (e.g., supplements)
- Personal and baby care
- Cleaning products

Recyclable: *Meets the following or passed the applicable APR benchmark and definitive tests*	
Bottle Resin	PET bottle grade with a crystalline melting point between 225° and 255°C
Resin Color	Clear, transparent light blue, or transparent green are currently preferred
Resin Additives	No degradable or biodegradable additives
Wrap Around Label or Cut & Stack	PP or PE (that float when printed)
Shrink Sleeve, Pressure Sensitive, or Direct Printed	An APR preferred option (Learn more at *https://plasticsrecycling.org/recognition/recipients*)
Attachments	Clear if PET; colored ok for PP or PE
Closures, Pumps, and Sprays	PP or PE that floats (no metal)
Cap Liner	Liner made from PE, EVA, or TPE or no liner
Tamper Evidence	Easily fully removable, PET, PP, PE (no PVC)
Feasible post-consumer recycled content levels based on current industry practice	
Minimum (may increase over time)	25% PCR
Maximum	Up to 100% PCR

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Walmart sustainable packaging playbook deep dive: Supporting Recycling

PET Bottles

Application Notes

informative, not comprehensive

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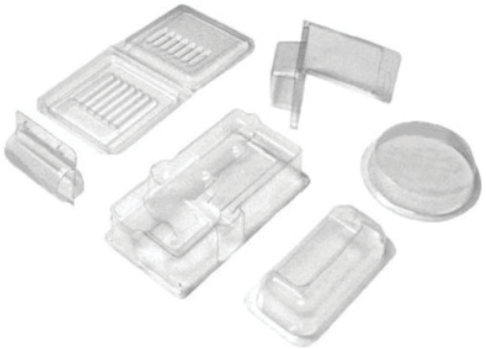
- Water and beverages
- Grocery (e.g., condiments, sauces)
- Health & Wellness (e.g., supplements)
- Personal and baby care
- Cleaning products

Recyclability Challenges	Examples	Guidance
Nylon Layers	Sparkling mineral water, jars, and juice	Use the APR recognized options or innovate to use recycling compatible options
Oxygen Scavenger (or other) Additives	Juice, tea, and coffee	Use the APR recognized options or innovate to use recycling compatible options (ex. EvOH at low%)
Paper Labels	Many products	These are a low cost option that either need to pass APR benchmark and definitive tests or be replaced with non-paper APR recognized options
Pressure Sensitive and Shrink Sleeve Labels	Many products	Use the APR recognized options (Learn more at https://plasticsrecycling.org/recognition/recipients)
Metal Parts in Cap, Pump, or Spray	Beverages, cleaning, and personal care products	Look for all plastic caps, pumps, or sprays (some applications may have functional limitations and How2Recycle® labels should be used to clearly communicate that the cap, pump, or spray with metal needs to be removed before recycling)
PETG	Beverages	PETG is not the same thing as PET and should be designed out of PET packaging
Materials that present recyclability challenges		
Resin	PETG, or Other non-compatible resins mixed in (some EvOH levels are ok)	
Resin Color or Additives	Transparent colors other than blue and green, opaque colors, dark colors, degradable additives (no biodegradable additives)	
Attachments and Closures	Metal, Foils, PS, PVC, PLA, TPE/Silicon with density > 1	
Labels	Metal foil, metalized printing, PS, PVC, PLA, full body shrink sleeve or pressure sensitive labels that are not APR preferred, does not pass near infrared (NIR) Sorting Potential Test, greater than 60% printed label coverage of the container side wall section for pressure sensitive or 75% for sleeves, or paper labels that are not APR preferred, avoid bleeding inks	

Suppliers are reminded that they are responsible for the compliance of their products, including their products packaging, with all applicable laws and regulations, including laws and regulations applicable to recyclability and compostability, such as the FTCs Green Guides and California's Public Resources Code. Walmart does not give its suppliers legal advice. Suppliers should consult their own counsel with questions about the applicability of laws and regulations to their products and packaging.

Walmart sustainable packaging playbook deep dive: Supporting Recycling

PET Thermoforms
(e.g., Boxes, Clamshells, Cups)



Application Notes
informative, not comprehensive

PET Thermoforms is often used with the following:

- Bakery and Deli
- Eggs
- General Merchandise (Sporting goods, Automotive, Home)

Recyclable: *Meets the following or passed the applicable APR benchmark and definitive tests*	
Bottle Resin	PET bottle grade with a crystalline melting point between 225° and 255°C
Resin Color	Clear, transparent light blue, or transparent green
Resin Additives	No degradable or biodegradable additives
Label	PP or PE (that float when printed)
Attachments	Clear PET, PP, or PE
Tamper Evidence	Easily fully removable, PET, PP, or PE (no PVC)
Dimensions	Larger than 2 inches in 2 dimensions and largely 3 dimensional (than flat)
Feasible post-consumer recycled content levels based on current industry practice	
Minimum (may increase over time)	25% PCR
Maximum	Up to 100% PCR

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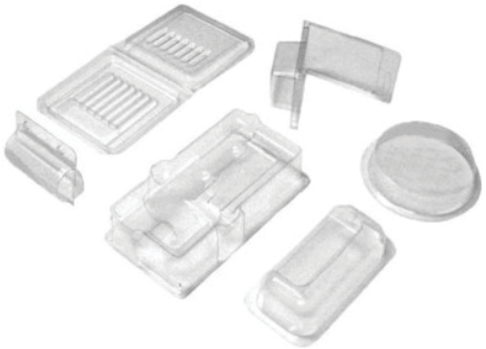
Walmart sustainable packaging playbook deep dive: Supporting Recycling

PET Thermoforms
(e.g., Boxes, Clamshells, Cups)



Application Notes
informative, not comprehensive

PET Thermoforms is often used with the following:

- Bakery and Deli
- Eggs
- General Merchandise (Sporting goods, Automotive, Home)

Recyclability Challenges	Examples	Guidance
Black Trays	Bakery and Produce	Black currently isn't detected in sorting for PET, has no valuable end markets, it should be switched to clear or transparent light blue or green if it isn't 100% PCR
Non-PET Clamshells	Variety of products	Look to switch to a recyclable format (e.g., paper, PET)
Blister Packages (e.g., paper and plastic or other combination packages)	Toys, General Merchandise, Health & Wellness	These are often hard to separate or are not used by recyclers, design or innovate to use a recyclable package (i.e., single material or easily seperable paper, PET, PE film/bag)
Materials that present recyclability challenges		
Resin	PETG, or other resins mixed in	
Resin Color or Additives	Transparent colors other than blue and green, opaque colors, dark colors, degradable additives (no biodegradable additives)	
Attachments and Closures	Metal, foils, PS, PVC, PLA	
Labels	Metal foil, metalized printing, PS, PVC, PLA, full body shrink sleeve or pressure sensitive labels that are not APR Preferred, Does not pass near infrared (NIR) Sorting Potential Test, Greater than 60% printed label coverage of the container side wall section for pressure sensitive or 75% for sleeves, or Paper labels that are not APR preferred, avoid bleeding inks	

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Walmart sustainable packaging playbook deep dive: Supporting Recycling

HDPE Bottles

Application Notes

informative, not comprehensive

HDPE bottles is often used with the following:

- Milk
- Baby formula
- Health & Wellness (supplements, medicine)
- Personal and baby care
- Cleaning products

Recyclable: *Meets the following or passed the applicable APR benchmark and definitive tests*	
Bottle Resin and Fillers	HDPE density 0.94-0.96
Resin Color	Unpigmented, translucent, opaque colors (not dark)
Resin Additives	No degradable or biodegradable additives
Layers	PE or EVOH less than 3%
Labels	PE, PP (avoid paper labels)
Adhesives	Wash off cleanly or minimal/no adhesive
Attachments, Closures, Pumps and Sprays	PE, PLA, or PS (not metal)
Cap Liner	PE, EVA or TPE
Tamper Evidence	PE, PETG
Feasible post-consumer recycled content levels based on current industry practice	
Minimum (may increase over time)	10% PCR for transparent/natural 25% PCR for colored
Maximum	Up to 100% PCR

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Walmart sustainable packaging playbook deep dive: Supporting Recycling

HDPE Bottles

Application Notes

informative, not comprehensive

<u>HDPE bottles is often used with the following:</u>

- Milk
- Baby formula
- Health & Wellness (supplements, medicine)
- Personal and baby care
- Cleaning products

Recyclability Challenges	Examples	Guidance
Metal Parts in Cap, Pump, or Spray	Sometimes used for cleaning and personal care	Look for single material plastics to use/replace current caps, pumps, or sprays
Fillers	When fillers are added to change the density of the package so that it sinks	Adjust the use of the filler to ensure the package floats
Materials that present recyclability challenges		
Resin	Other resins mixed in	
Resin Color or Additives	Dark colors with L value less than 40 or near-infrared (NIR) reflectance less than or equal to 10% (can't be sorted), for non-mechanical oil products (which aren't collected for recycling), or degradable additives (no biodegradable additives)	
Attachments and Closures	Metal, foils, PVC, floating silicones, or PP	
Labels	Metal foil, paper, PVC, PS, PLA, adhesives that do not wash off cleanly, does not pass near infrared (NIR) Sorting Potential Test, greater than 60% printed label coverage of the container side wall section for pressure sensitive or 75% for sleeves	

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Walmart sustainable packaging playbook deep dive: Supporting Recycling

PE Bags and Film

Application Notes
informative, not comprehensive

PE Bags and Film is often used with the following:

- Food
- Frozen food
- Cleaning products
- Household paper
- Personal and baby care
- Pet care
- Arts & Crafts
- Electronics
- General Merchandise (DIY, Sporting goods, Home)
- Home and garden
- Party supplies

Recyclable at Retail Drop-off: *Meets the following or passed the applicable APR benchmark and definitive tests*	
Film Resin	LDPE, MDPE, LLDPE, or HDPE film
Resin Color	Unpigmented is best or white or light colors
Resin Additives	No degradable or biodegradable additives
Fillers	Ensure density of blend is less than 1.0
Layers	PE
Labels	PE or direct printed
Attachments	PE
Feasible post-consumer recycled content levels based on current industry practice	
Minimum (may increase over time)	No minimum PCR content, but may be added in the future

Reminder - **Packaging formats not yet in the Playbook Deep Dive, include but not limited to:** Multi-layer Packaging

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Walmart sustainable packaging playbook deep dive: Supporting Recycling

PE Bags and Film

Application Notes
informative, not comprehensive

PE Bags and Film is often used with the following:

- Food
- Frozen food
- Cleaning products
- Household paper
- Personal and baby care
- Pet care
- Arts & Crafts
- Electronics
- General Merchandise (DIY, Sporting goods, Home)
- Home and garden
- Party supplies

Recyclability Challenges	Examples	Guidance
Food-contact Products	Variety of products	Ensure that the package can be easily cleaned or have no/low contamination/residue (e.g., bread) otherwise find another recyclable package design
Recycled Content	Variety of products	No minimum due to limited availability of options currently available
Multi-material Packages (not all PE)	Frozen food and wipes	Look for options that are compatible with recycling or innovate to use recycling compatible options
Materials that present recyclability challenges		
Resin	Any non-PE resins mixed in	
Resin Color or Additives	Dark colors (e.g., blue, green), PVC, PVDC, metalized layers, fillers that alter the blend density to be greater than 1.0, starch resins, or degradable additives (no biodegradable additives)	
Attachments and Closures	Metal, foils, PET, PLA, PP, PS, PVC	
Labels	Metal foil, metalized printing, paper, PET, PLA, PP, PS, PVC	

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Walmart sustainable packaging playbook deep dive: Supporting Recycling

Paperboard

Application Notes
informative, not comprehensive

Paperboard is often used with the following:

- Food
- Frozen food
- Cleaning products
- Health & Wellness (supplements, medicine)
- Personal, hair, and baby care
- Cosmetics
- Pet care
- Office supplies
- Arts & Crafts
- Apparel (shoes, baby, women, men)
- Electronics
- General Merchandise (DIY, Sporting goods, Automotive, Home, Kitchen, Jewelry)
- Home and garden
- Party supplies
- Toys

Recyclable and Sustainably Sourced: Meets the following	
Material	Certified responsibly sourced fiber (e.g., FSC*) and/or recycled fiber
Wet Strength Additives	Compatible with repulping as confirmed by Western Michigan University testing
Coatings	No coatings or clay coatings (no wax or polycoatings)
Adhesives	Minimal adhesives and tape or hydrophobic adhesives
Attachments	Certified responsibly sourced fiber (e.g., FSC*) and/or recycled fiber
Labels and Graphics	Paper or direct printed
Dunnage and Padding	Certified responsibly sourced fiber (e.g., FSC*) and/or recycled fiber options or PE film pillows and cushioning

**For the purposes of Project Gigaton, FSC-certified virgin content from all countries is recognized; SFI from the US and Canada only; PEFC from Anguilla, Belgium, Czech Republic, Denmark, Estonia, Germany, Hungary, Ireland, Latvia, Lithuania, Netherlands, Portugal, South Korea, Spain, Switzerland, or the UK.*

Reminder - **Packaging formats not yet in the Playbook Deep Dive, include but not limited to:** shelf stable or refrigerated cartons, coated cartons, or blister packages

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Walmart sustainable packaging playbook deep dive: Supporting Recycling

Paperboard

Application Notes
informative, not comprehensive

Paperboard is often used with the following:

- Food
- Frozen food
- Cleaning products
- Health & Wellness (supplements, medicine)
- Personal, hair, and baby care
- Cosmetics
- Pet care
- Office supplies
- Arts & Crafts
- Apparel (shoes, baby, women, men)
- Electronics (printer cartridges, accessories)
- General Merchandise (DIY, Sporting goods, Automotive, Home, Kitchen, Jewelry)
- Home and garden
- Party supplies
- Toys

Recyclability Challenges	Examples	Guidance
Frozen Food Cartons	Frozen foods	Ensure that there is an end market for the material and consider having Western Michigan University test the package or innovate to use recycling compatible options
Food-contact and Oily/Liquid-contact Products	Variety of products	Ensure that the package can be easily cleaned or have no/low contamination/residue (e.g., frozen waffles) otherwise find another recyclable package design
Materials that present recyclability challenges		
Color, Layers, or Additives	Laminated metalized film, plastic/polymer/resin coatings (one side is better than both the outside and inside coated), wet strength additives that haven't passed Western Michigan University testing, dark colors, high gloss finishes, foils, fragrances	
Attachments and Adhesives	Metal, magnetic closures, electronics, radio-frequency identification, PET, PLA, PP, PS, PVC, stickers and adhesives (unless passes Western Michigan University testing)	
Labels	Metal foil, metalized printing, PET, PLA, PP, PS, PVC	
Dunnage and Padding	EPS	

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Walmart sustainable packaging playbook deep dive: Supporting Recycling

Corrugated Board

Application Notes

informative, not comprehensive

Corrugated Board is often used with the following:

- E-commerce shipping boxes

Recyclable and Sustainably Sourced: Meets the following	
Corrugated Box Material	Certified responsibly sourced fiber (e.g., FSC*) and/or recycled fiber
Color	Natural color
Coatings	No coatings or clay coatings (no wax or polycoatings)
Graphics	Direct printed (no foils or metalized)
Adhesives	Minimal adhesives and tape
Attachments	Fiber
Shipping Labels	Paper or direct printed
Dunnage and Padding	Tree-based fiber options or PE film pillows and cushioning

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Walmart sustainable packaging playbook deep dive: Supporting Recycling

Corrugated Board

Application Notes

informative, not comprehensive

Corrugated Board is often used with the following:

- E-commerce shipping boxes

Recyclability Challenges	Examples	Guidance
Any addition that was not listed as recyclable	Variety of applications	Consider having the package tested by Western Michigan University
Materials that present recyclability challenges		
Color, Layers, or Additives	Laminated metallized film, plastic, polymer, or resin coatings, wax coatings, or wet strength additives that haven't passed Western Michigan University testing, dark colors, high gloss finishes, foils, fragrances	
Attachments	Metal, magnetic closures, electronics, radio-frequency identification, PET, PLA, PP, PS, or PVC	
Labels	Metal foil, metalized printing, PET, PLA, PP, PS, PVC	
Dunnage and Padding	EPS	

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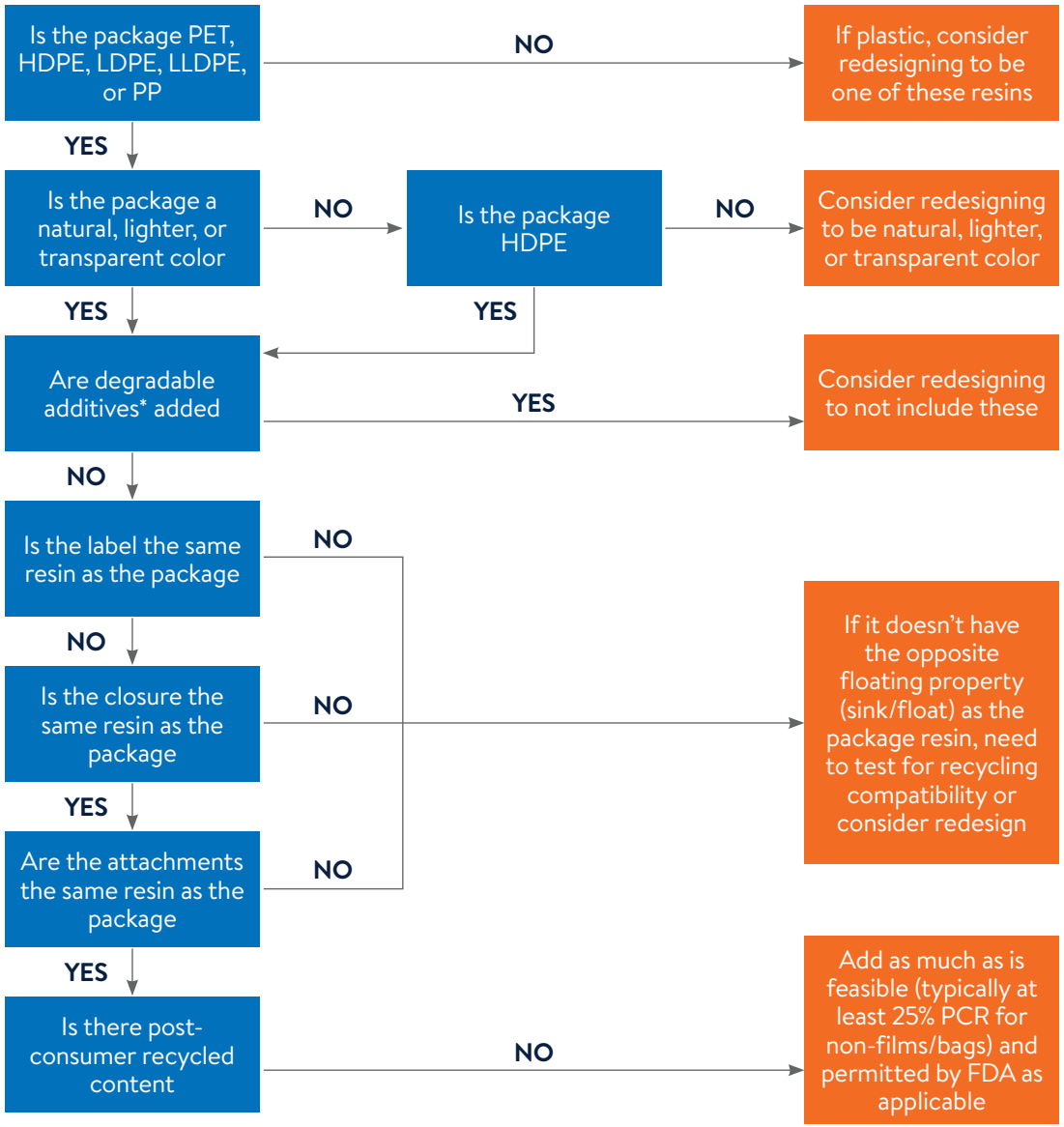
Walmart sustainable packaging playbook deep dive: Supporting Recycling

A decision tree to help identify ways to improve recyclability on other plastic packaging



Suppliers are reminded that they are responsible for the compliance of their products, including their products packaging, with all applicable laws and regulations, including laws and regulations applicable to recyclability and compostability, such as the FTCs Green Guides and California's Public Resources Code. Walmart does not give its suppliers legal advice. Suppliers should consult their own counsel with questions about the applicability of laws and regulations to their products and packaging.

Walmart

Walmart sustainable packaging playbook deep dive: Supporting Recycling

Appendix

February 21, 2019

Terms and Acronyms

Packaging components: Part of packaging that can be separated by hand or by using simple physical means (Source: ISO 18601:2013).

Preferred: Attributes that support recycling by the majority of the Materials Recovery Facilities and recyclers with minimal, or no, negative effect on the productivity of the operation or final product quality (Source: APR Design® Guide for Plastics Recyclability)

Recyclable: If its successful post-consumer collection, sorting, and recycling is proven to work in practice and at scale (Source: Ellen MacArthur Foundation New Plastics Economy Commitment).

Recycled content: Materials have been recovered or diverted from the waste stream after consumer use (also referred to as post-consumer recycled content (PCR)). The minimum levels in the Best Practices refer to the main packaging material (e.g., a bottle vs. the label).

For questions contact – *Ashley.c.Hall@walmart.com*

EVOH: ethylene vinyl alcohol

FSC: Forest Stewardship Council

HDPE: high density polyethylene

LDPE: low density polyethylene

LLDPE: linear low density polyethylene

PE: polyethylene

PET: polyethylene terephthalate

PETG: polyethylene terephthalate glycol

PLA: polylactic acid

PP: polypropylene

PS: polystyrene

PVC: polyvinyl chloride

For more information: APR Design® Guide For Plastics Recyclability