Problematic and Unnecessary Materials Report

A resource to help enable advancements in circular package design, increase opportunities for recovery, and enhance the quality of recycled content available for manufacturers.

Rev. April 2024

Introduction

The U.S. Plastics Pact (U.S. Pact)'s mission is to facilitate the transition to a circular economy for plastic packaging in the U.S. by bringing together resources and expertise across the entire plastics value chain. Engaging stakeholders in concert towards the same targets will initiate a profound paradigm shift involving rethinking and innovating the life cycle of materials.

Our targets are interconnected. Eliminating problematic and unnecessary materials to meet Target 1 is the keystone that supports the achievement of all other targets. The removal of problematic and unnecessary materials will enable advancements in circular package design, increase opportunities for recovery, and enhance the quality of recycled content available for manufacturers.

The U.S. Pact brings together more than 130 businesses, not-for-profit organizations, academic and research institutions, and government agencies known as "Activators" who work together toward achieving a circular economy. The U.S. Plastics Pact's work encompasses most plastic packaging and some related ancillary materials. U.S. Pact Activators produce 33% of all plastic packaging in scope in the country by weight. Progress toward elimination of problematic and unnecessary materials is documented in the U.S. Pact's annual reports.

Roadmap to 2025 Targets:

Roadmap 2.0 Targets:

1. Eliminate all items on the Problematic and Unnecessary Materials List and reduce the use of virgin plastic by 30% by 2030
2. Design and manufacture 100% of plastic packaging to be reusable, recyclable, or compostable
3. Effectively recycle 50% of plastic packaging and establish the necessary framework to recycle or compost packaging at scale
4. Achieve an average of 30% postconsumer recycled content or responsibly sourced biobased content across all plastic packaging
5. Identify viable reusable packaging systems and increase their implementation and scale by 2030, as part of reducing the use of virgin plastics

Definition of "Problematic or unnecessary"

Plastic packaging items, components, or materials where consumption could be avoided through elimination, reuse or replacement and items that, post-consumption, commonly do not enter the recycling and/or composting systems, or where they do, are detrimental to the recycling or composting system due to their format, composition, or size.

In addition to the items on our lists, the workstream recommends minimal material use. Where possible, avoid excess packaging (e.g., head space or nonfunctional "slack-fill") to be fit for purpose and remove any unnecessary layers of packaging. Avoid use of known toxic chemicals, as defined by relevant governing bodies (e.g. EPA, CDC, FDA, state regulations applicable for the context of use), that are intentionally added either in the package or in the manufacturing of that package.

Ability for Items to Be Removed from the Problematic and Unnecessary Materials List

Items on the Problematic and Unnecessary Materials List may be either removed from consideration as problematic or unnecessary, or recommended for the Evaluation List. Items may be removed for consideration as problematic or unnecessary if Criterion 1 of the Problematic & Unnecessary Materials Criteria is met (i.e. the item is circular, meeting the definition of reusable, recyclable, or compostable, and therefore is no longer eligible for consideration as problematic or unnecessary). Items may be recommended for the Evaluation List if changes in industry accepted third party market indicators (e.g., design guidance, bale specifications, access data) suggest that the item is on a trajectory to meet Criterion 1 by the next evaluation year, as described in the Roadmap 2.0.

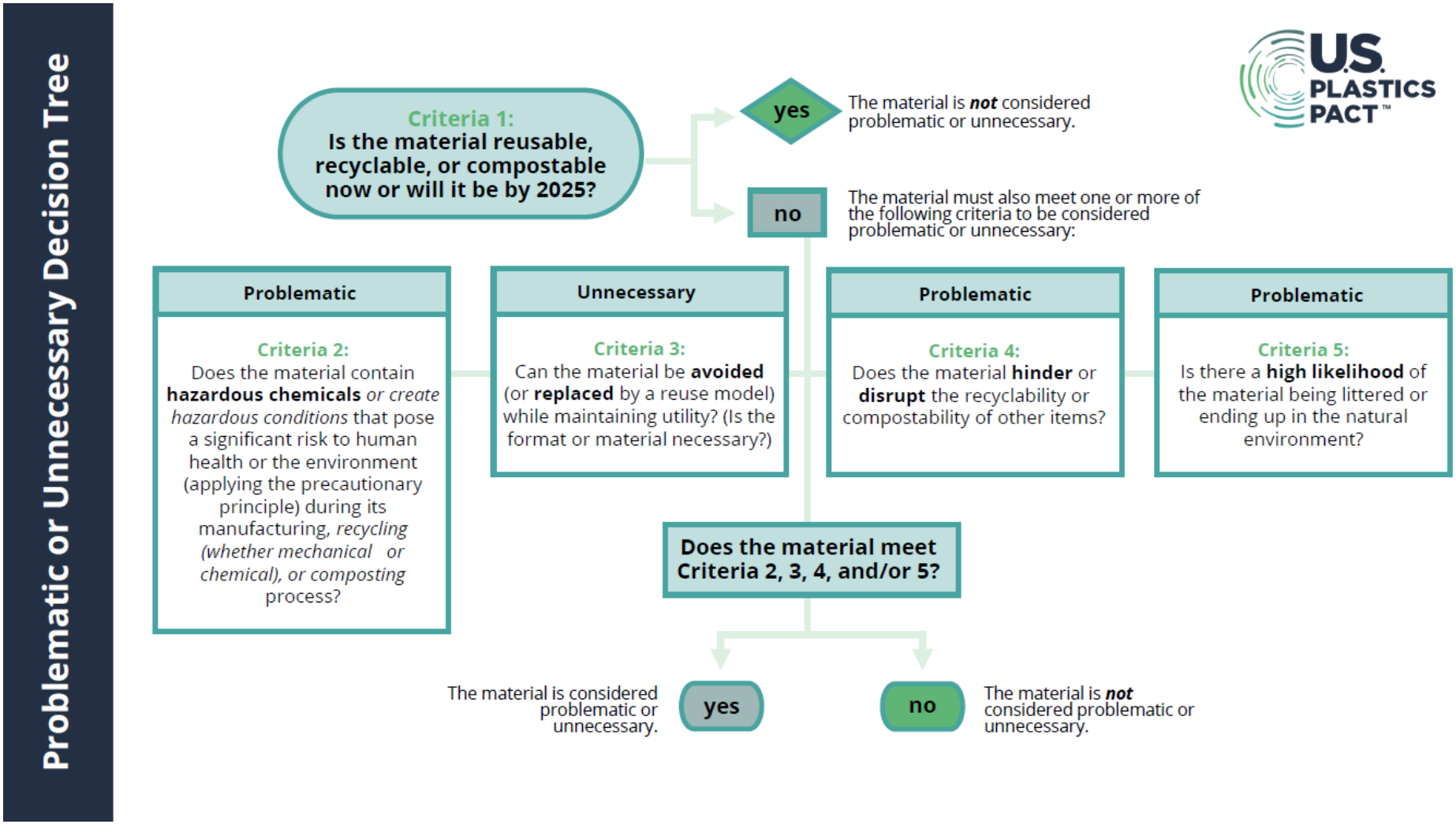
Changes related to items meeting or failing Criterion 1 should be brought to the attention of the Problematic & Unnecessary Materials Workstream for further evaluation.

Exclusions

The list applies exclusively to plastic packaging. Medical plastics used in clinical, hospital, and related laboratory and research settings are not included. This exclusion does not apply to pharmaceutical packaging, e.g., over the counter or prescription medicines packaged in plastic.

Criteria

The following criteria are provided to identify problematic or unnecessary plastic packaging or plastic packaging components. Definitions used in the criteria derive from the Ellen MacArthur Foundation's global Plastics Pact Network, which provides the framework for the U.S. Pact. U.S. adaptations to the criteria are provided *in italics*. The criteria were unanimously approved by Activators in July 2021.



Problematic and Unnecessary Materials List (in alphabetical order)

Item	Approved by Activators	Timeline to eliminate (end of year)
Cutlery[1]	December 14, 2021	2025
Degradable and biodegradable materials that are not certified compostable, including bio-assimilating, oxo-degradable, oxo-biodegradable, and photodegradable materials used in plastics packaging. Acceptable certified compostable materials are detailed in the U.S. Plastics Pact Design for Compostability Playbook.	December 14, 2021 (Oxo-Degradable & Oxo-biodegradable Additives) Updated April 16, 2024	2025 (Oxo-Degradable & Oxo-biodegradable Additives) 2030 (other degradable & biodegradable materials)
Foamed PET, including micro-foaming and foamed layers for the purpose of lightweighting when they interfere with sortation and density requirements per the APR Design® Guide	April 16, 2024	2030
Intentionally added[2] Per- and Polyfluoroalkyl Substances (PFAS)[3]	January 18, 2022	2025
Multi-material[4] Film and Flexible Plastic Packaging in the following applications. Mono-material designs are acceptable, as detailed in the U.S. Plastics Pact Design for Circularity Playbooks. ○ Multi-material film or bags for general merchandise (non-food items or dry goods that do not have a stated shelf life or best before date); ○ Secondary multi-material film or bags for individually wrapped items (such as shrink wrap or an outer bag); ○ Multi-material pallet stretch wrap; ○ Multi-material bread bags; ○ Multi-material cereal bags; ○ Multi-material bags for fresh and frozen fruit; ○ Multi-material bags for fresh and frozen vegetables (cook-in-bag products excluded)	April 16, 2024	2030
Multi-material[4] Rigid Plastic Packaging. Exception: multi-material rigid thermoforms (see Evaluation List). Mono-material designs are acceptable, as detailed in the U.S. Plastics Pact Design for Circularity Playbooks.	April 16, 2024	2030
Non-compostable Produce Stickers	April 16, 2024	2030
Non NIR-Detectable Pigments such as Carbon Black	December 14, 2021	2025

Opaque or Pigmented PET – Polyethylene Terephthalate bottles (any color other than transparent blue or green)	December 14, 2021	2025
Oxo-Degradable Additives, including Oxo-biodegradable Additives	December 14, 2021	2025
PETG – Polyethylene Terephthalate Glycol in rigid packaging	December 14, 2021	2025
Problematic Label Constructions – This includes adhesives, inks, materials (e.g., PETG, PVC, PLA, paper). Avoid formats/materials/features that render a package detrimental or non-recyclable per the APR Design® Guide. Labels should be APR Recognized or meet APR Preferred Guidance for coverage and compatibility and be tested in any areas where this is unclear.	December 14, 2021	2025
PS – Polystyrene, including EPS (Expanded Polystyrene)	December 14, 2021	2025
PVC – Polyvinyl Chloride, including PVDC (Polyvinylidene Chloride)	December 14, 2021	2025
Stirrers[1]	December 14, 2021	2025
Straws[1]	December 14, 2021	2025

[1] When non-reusable, non-recyclable, or non-compostable per U.S. Pact definitions and provided as an ancillary item to the primary container. For instance, a packet of plastic cutlery provided with a prepared salad, or a straw/stirrer provided with an on-the-go beverage would be defined as problematic whereas cutlery, straws, or stirrers sold as a product would not.
[2] "Intentionally added" either in the package or in the manufacturing of that package.
[3] "PFAS" or perfluoroalkyl and polyfluoroalkyl substances are defined as the class of fluorinated organic chemicals containing at least one fully fluorinated carbon atom at or above 100 parts per million, as measured in total organic fluorine.
[4] Multi-material packaging combines dissimilar materials (including labels, attachments, and other features of the complete package design) that are unable to be reprocessed together. Multilayer packaging, when constructed with mono-materials and compatible barriers, is acceptable as detailed in the U.S. Plastics Pact Design for Circularity guidance. Elimination is specific to multi-material packaging designs that do not comply with the Design for Circularity guidance. Mono-material packaging designs that meet the Design for Circularity guidelines are NOT considered problematic or unnecessary.

During the next two years, the U.S. Pact will continue to investigate additional items for potential elimination. Participation in the U.S. Pact is voluntary and does not necessarily signify an individual Activator's endorsement of the list.

Evaluation List (in alphabetical order)

Approved by Activators April 16, 2024. The next evaluation period is 2026.

Defining problematic & unnecessary materials is a delicate balance between what is true today and planning for an improved material management system in 2030.

Based on existing knowledge, elimination is not currently an appropriate approach to solving the challenges these items present. Circularity for these items can be achieved by 2030 (and therefore they would meet Criterion 1) if the key actions identified are taken.

The intent of acknowledging items on this Evaluation list is to provide transparency about challenges to circularity and spur concerted efforts across the value chain that address these challenges. Key actions for each item have been identified and include innovation, redesign, avoidance of unnecessary material use, and investments in consumer messaging, collection, and processing infrastructure. Solutions should provide the least path of resistance for consumers.

U.S. Pact Activators will continue to explore solutions to address the key actions identified. While items on the Evaluation List are not time-bound for action, an additional review period will be undertaken in 2026 [per Roadmap 2.0] to assess progress and gather publicly available data. At that time, items currently on the Evaluation list may be either removed from consideration as problematic or recommended for elimination. Items may be removed from the Evaluation list if Criterion 1 is met (i.e., the item is circular, therefore no longer eligible for consideration as problematic or unnecessary). Items may be recommended for elimination if they continue to fail Criterion 1 and meet at least one other criterion.

Item	Key Actions
Multi-material Rigid Thermoforms	Galvanize necessary innovations in mono-material (and/or compatibilizer) package design and manufacturing processes to comply with the U.S. Pact Design for Circularity Playbooks and highlight new innovations through forums such as the U.S. Plastics Pact multi-material film and flex replacement technical workshops. For applications that do not have an identified mono-material solution, identify potential opportunities through chemical recycling or other processes and develop viable collection programs and end markets. Companies with applications that do not have an identified mono-material solution should also consider reusable formats or compostable formats (for packaging that has food contamination).

Non-Compostable Plastic Beverage Pods	Collect additional data on recyclability parameters such as MRF acceptance and sortation as well as consumer adherence to recyclability preparation instructions to eliminate organic waste from the recycling process. Utilize reusable or certified compostable pods. Provide clear and consistent guidance to users. If compostable, dual compostability (home and industrial) is ideal. For this to be achieved, home compostability standards and certification need to be developed for North America (currently underway with ASTM and BPI). Industrial composting collection and processing infrastructure needs to be further developed as this would exceed home composting volume.
Other Multi-material Film and Flexible Packaging that does not comply with the U.S. Plastics Pact Design for Circularity Playbooks	Galvanize necessary innovations in mono-material (and/or compatibilizer) package design and manufacturing processes to comply with the U.S. Pact Design for Circularity Playbooks and highlight new innovations through forums such as the U.S. Plastics Pact multi-material film and flex replacement technical workshops. For applications that do not have an identified mono-material solution, identify potential opportunities through chemical recycling or other processes and develop viable collection programs and end markets. Companies with applications that do not have an identified mono-material solution should also consider reusable formats or compostable formats (for packaging that has food contamination).
Produce/Bulk Bags	Support the expanded use of reusable bags (consumer owned or rental programs) through consumer engagement. Develop and support convenient, robust take-back programs for PE bags and films inclusive of robust end market demand. Develop and support end markets for curbside recycled (MRF) film. Provide clear and consistent recycling guidance to users.
Single-use Shopping Bags	Support the expanded use of reusable bags (consumer owned or rental programs) through consumer engagement. Develop and support convenient, robust take-back programs for PE bags and films inclusive of robust end markets. Develop and support end markets for curbside recycled (MRF) film, including what can be accepted in bale specifications for chemical recycling processes. Provide clear and consistent recycling guidance to users. The elimination of single-use plastic bags may not be the most environmentally responsible solution due to the potentially higher resource intensity and carbon impact of fiber-based bags and reusable bags that are not actually reused (and which are not recyclable).

Small Format Packaging, e.g. loose bottle caps, small bottles – Packaging that fails to meet the Preferred assessment for Size Sorting Potential (APR Sort-B-02, Evaluation of Size Sorting Potential for Articles with at Least 2 Dimensions Less than 2 Inches)	Conduct APR Sortation Test(s) for size and 2d3d as relevant. Explore alternate product delivery systems such as bulk dispensers and reuse/refill. Explore design solutions, i.e., tethered caps/tops and certified compostable formats for food applications. Develop and support robust collection/take-back programs. Develop robust end markets in order to develop MRF infrastructure.

Addressing Material Substitutions

The scope of the criteria and assessment of problematic materials is limited to plastic packaging within the Scope of the U.S. Plastics Pact. Material substitutions inevitably produce trade-offs for sustainability performance. When considering material substitution, we encourage Activators to switch to more circular (i.e., reusable, recyclable, or compostable) resins with better environmental profiles.

When an existing problematic plastic packaging is replaced by a new plastic material, Activators are encouraged to carry out assessments for emissions, water use, and the overall environmental benefits. That analysis should include recyclability and/or compostability as criteria for comparison.

When considering substitution to a non-plastic material such as paper, glass, or metal, the packaging will be considered out of scope for the U.S. Plastics Pact and Activators should report the change as part of the annual reporting process. We encourage Activators to carry out due diligence to ensure that the new material is not causing additional negative human health or environmental impacts.