

# Sustainability in Pharmaceutical Packaging

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The pharmaceutical packaging industry is facing increasing pressure to adopt more sustainable practices and to use more sustainable materials. This is in part due to the carbon footprint of pharmaceutical packaging, which is traditionally plastic based. One study estimates that the pharmaceutical industry is responsible for emitting around 52 million metric tons of CO<sub>2</sub> annually.

Furthermore, consumers are becoming increasingly influential over the demand for sustainable products and materials. Approximately 70% of global consumers are willing to pay more for sustainable packaging. Similarly, a demand for a more environmentally friendly packaging is also rising in the pharmaceutical sector, with more patients and consumers considering sustainability factors when choosing products. For example, since April 2022, National Health Service (NHS) procurements have to include a minimum 10% net zero and social value weighting in the United Kingdom (UK).

This shift is due to the growing awareness of the environmental impact of plastic pollution, the increasing demand for recyclable and compostable packaging materials, and the need to reduce the carbon footprint of pharmaceutical supply chains.

In response to these challenges, the pharmaceutical industry is developing new and innovative packaging solutions.

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## The Environmental Impact of Pharmaceutical Packaging

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Steps are being taken by organizations and industries to improve the use of bio-sourced materials, recycled content, or where permitted, alternative compostable and sustainably sourced packaging materials. However, there remains a significant challenge surrounding the

use of energy and resources in the production of most packaging materials and greenhouse gas emissions throughout the supply chain and subsequent transportation of packaging materials from manufacturing to the point of sale. Additionally, many packaging formats, whether sustainably derived and sourced or otherwise, do not have sufficient infrastructure or processes in place to mitigate the generation of waste at the end of life of the packaging.

Organizations such as the Circularity in Primary Pharmaceutical Packaging Accelerator (CiPPPA) have been assembled to combat these issues and are working to reduce pharmaceutical packaging waste and deliver aspects of circularity. Duncan Flack, Chairman of CiPPPA said

“CiPPPA is a Not-for-Profit industry-wide, multi-stakeholder initiative with a mission of enabling companies, as well as members of the public, to recycle their primary pharmaceutical packaging, thereby contributing to the elimination of waste, whilst reducing greenhouse gas emissions. The initiative will achieve its ambitions by focusing on the packaging waste generated by blister packs, injector pens, and inhalers, and is being supported by major players across the Big Pharma and Healthcare sectors”.

## The Founding Principles – Reduce, Reuse, Recycle

Working within the founding principles of sustainability of “Reduce, Reuse, Recycle”, one of the simplest ways of improving the sustainability of pharmaceutical packaging is to use less packaging.

Some materials can be thinned down, whilst other improvements can be achieved by choosing lightweight materials or switching from one packaging format to another.

For example, by packaging drugs in a thermoformed blister made of Honeywell’s Aclar® instead of Cold Form Foil (CFF), the blister card can be reduced in size by up to 50%, while still delivering a high moisture barrier to protect medicines. Whilst blister cards are typically already very light weight, the consequential savings that are derived from smaller blisters, smaller cartons, smaller shippers, and the reduction in volume taken up in shipping containers, all represent changes that can be easily implemented, requiring less energy to transport, and enabling emissions reductions within pharmaceutical supply chains.

Despite various steps to reduce or reuse packaging, regulations and health concerns surrounding patient safety rightly remain utmost, and many items are still inherently single use by design. In such instances, recycling materials is often seen as one of the most effective ways to reduce the environmental impact of pharmaceutical packaging.

Recycling pharmaceutical packaging materials is far from straight forward, as traces of active pharmaceutical ingredients need to be considered within the recycling process and the energy requirements for the collection, sorting, collation, and recycling of the materials,

whilst reducing the amount of waste sent to landfills or incineration, can still be inhibitive when looking at the footprint associated with the full product lifecycle.

Biodegradable and compostable materials are becoming increasingly popular in the packaging world, and in certain secondary or tertiary applications these materials which break down naturally in the environment without releasing pollutants or unwanted materials are gaining popularity.

Mono materials are single structure materials that can be easily recycled. Companies are increasingly looking to embrace these mono structures for low barrier purposes to help keep packaging materials out of landfills and ensure that they are either reused or recycled.

Further developments see pharmaceutical packaging gradually designed for easy recycling. Typical changes include using clear labelling that makes it easy to identify the materials used in the packaging and using standard packaging formats which allow recycling facilities to process the materials more easily.

## At the Forefront of Innovative and Sustainable Packaging Solutions

Despite these advances and refined approaches, the fundamental requirement that pharmaceutical packaging must meet is the need to balance sustainable packaging whilst ensuring the safety and efficacy of medications. Pharmaceutical packaging must protect medications from contamination and degradation, and it must also be tamper-evident to prevent counterfeiting.

High barrier materials which enable degradation and contamination-free packaging require careful engineering and manufacturing and isn’t always a cheap option. This means that high performance sustainable packaging materials are often more expensive than traditional materials, which can ultimately push up the cost of medications.

There are, however, several emerging opportunities associated with sustainable pharmaceutical packaging. As the industry responds to the increasing pressure from consumers and regulators to adopt more sustainable practices, demand for innovative and sustainable packaging solutions will also increase.

As governments set emissions reductions targets and more companies publicly disclose their Science Based Target Initiatives (SBTis), net zero goals, and carbon reduction programs, sustainable packaging and policies that support their market growth will play a key part in the achievement of these targets.

In the coming years, we are likely to see even more innovative and sustainable packaging solutions being developed. These solutions will reduce the quantity of packaging produced, challenge the sourcing of materials that are mined or derived from fossil fuels, and ultimately serve to reduce the environmental impact of pharmaceutical packaging. All while still ensuring the safety and efficacy of medications.