SMASH PACKAGING

Packaging Sustainability Strategy

The SMASH Packaging Plan is part of our approach to a more responsible business. Let us know how we're doing and stay informed on our progress at **sigmaaldrich.com/greener**

Dear Customers, Colleagues, Partners and Stakeholders,

From life-saving therapies, diagnostics, and preventative solutions to more sustainable offerings and breakthrough technologies – at Merck Life Science, **we impact life and health with science.**

Our customers are at the heart of this progress. As they drive scientific progress for their communities, they need our products to arrive quickly, efficiently, and safely. Our packaging must meet their requirements for sterile environments, temperature control conditions and protect our products as they traverse the world.

Beyond addressing these critical logistical demands, we are also committed to serving as a sustainability multiplier for our customers and collaborators. We help them achieve their own sustainability goals through our commitment to reducing our ecological footprint.

A key pillar of this commitment is our SMASH Packaging program, which takes a holistic approach to minimizing the environmental impacts of our packaging throughout its life cycle. Building on the insights gained from the first iteration, we are refining our strategy for SMASH Packaging 2.0. This includes enhancing packaging data management, deepening team engagement, prioritizing high-impact projects, and increasing transparency in our progress.

We aim to embed sustainability into every packaging decision, aligning with our company's overall sustainability targets. **SMASH Packaging 2.0** focuses on achieving three main goals:

- **Reduce** 10% of packaging weight per unit sales by 2030.
- 100% of fiber packaging to be **deforestation-free** by 2030.
- 100% of packaging to be designed following **circular design principles** by 2030.

With bold, methodical, needle-moving actions, we can and will continue delivering breakthrough solutions for our customers, partners and stakeholders – creating a more sustainable tomorrow, together.

Dr. Matthias Heinzel
Member of the Executive Board
CEO Life Science

SMASH Packaging Strategy

From consultation with internal and external packaging and sustainability experts, we identified four pillars that are the foundations of our SMASH Packaging strategy. Based on these four pillars also known as the four S's, we set specific 2030 goals to drive more packaging sustainability across our organization and realize our packaging sustainability vision.

Vision

Packaging that is designed to minimize our environmental footprint while ensuring the quality and safety of our products.

2030 Goals

Reduce 10% of packaging weight per unit sales by 2030	100% of fiber packaging to be deforestation free by 2030	100% of packaging to be designed following circular design principles by 2030

Pillars

SHRINK

Reduce Amount of Packaging

Our aim is to eliminate the use of packaging that is excessive in size or weight which unnecessarily consumes more resources, generates excess waste, and increases emissions during transportation.

SECURE

Achieve Zero Deforestation

Our aim is to ensure that the wood and fiber-based packaging materials that we use do not contribute to deforestation.

SWITCH

Improve Material Sustainability

Our aim is to improve the sustainability of packaging materials by increasing the use of materials with lower environmental impacts and reducing the use of materials produced with chemicals of concern.

SAVE

Maximize Circularity

Our aim is to eliminate the use of packaging materials that are not compatible with recycling, increase the use of reusable packaging and providing customers with recycling guidance for our packaging materials.

Since 2019, **OVER 100**

PACKAGING PROJECTS have been COMPLETED or are IN PROGRESS

400+
metric tons
annually avoided

72.9%
packaging aligned
with zero-deforestation

65%
product development
projects aligned with
SMASH Packaging
sustainability standards

23%
reduction of expanded
polystyrene (EPS)

Reduce 10% of packaging weight per unit sales **by 2030.**

SHRINK

WHY?

Reducing overall packaging weight is considered a best practice across industries. Not only does it require less energy to create, but lighter packaging means lower shipping costs, decreased fuel consumption, and reduced materials which in turn, leads to reduced carbon footprint.

HOW?

- Explore existing packaging lightweighting opportunities, especially for high contributing packaging materials (i.e. wood, glass, corrugate, plastic).
- Eliminate unnecessary packaging components.
- Substitute packaging materials and designs with alternative ones that lead to packaging reduction.
- Investigate opportunities for reusable or bulk packaging solutions.
- Avoid the requirement of specific distribution packaging (i.e.cold chain or dangerous goods).
- Implement new processes and measures to minimize unused air space in distribution.

EXAMPLE

BULK PACKAGING FOR MILLISTAK+® PODS

Millistak+® HC, HC Pro, and Clarisolve Pods now have the option to be shipped through a bulk packaging solution. The new Bulk Packs consist of an innovative packaging system developed to optimize the number of units per pallet and reduce the amount of packaging compared to a single pack. Buying in bulk now offers between 33% to 53% less packaging waste depending on the product. It also leads to a significant reduction in operator time to open and manage the product and packaging.

100% of fiber packaging to be **deforestation-free by 2030.**

WHY?

Deforestation is a significant source of global warming and a threat to biodiversity, and demand for wood and fiber-based (i.e. paper or corrugated) packaging materials is a major driver of deforestation. We can reduce deforestation by using wood and fiber-based packaging that come from recycled material or that have sustainable forestry certification.

HOW?

- Identify deforestation risks in our wood and fiber packaging supply chain and take action to address these risks.
- Transition all wood and fiber packaging to be recycled, certified or from verified sources.
- Current progress is already underway with approximately 73% of our wood and fiber-based packaging that aligned with our zero deforestation standards.

EXAMPLE

IMPLEMENTATION OF SUSTAINABLE FORESTRY CERTIFICATION IN MOLSHEIM

We worked with our key corrugated vendors at our Molsheim site to progressively add sustainable forestry certification for most of our corrugated packaging materials. This represents approximately 1,000 tons of materials and more than 90% of the total amount of corrugated packaging used by the site annually.

100% of packaging to be designed **following circular design principles by 2030.**

SAVE

SWITCH

WHY?

Circular design principles consider every stage of a product's journey – before and after it reaches the customer, and is based on three principles, driven by design to: eliminate waste, circulate materials at their highest value, and regenerate nature.

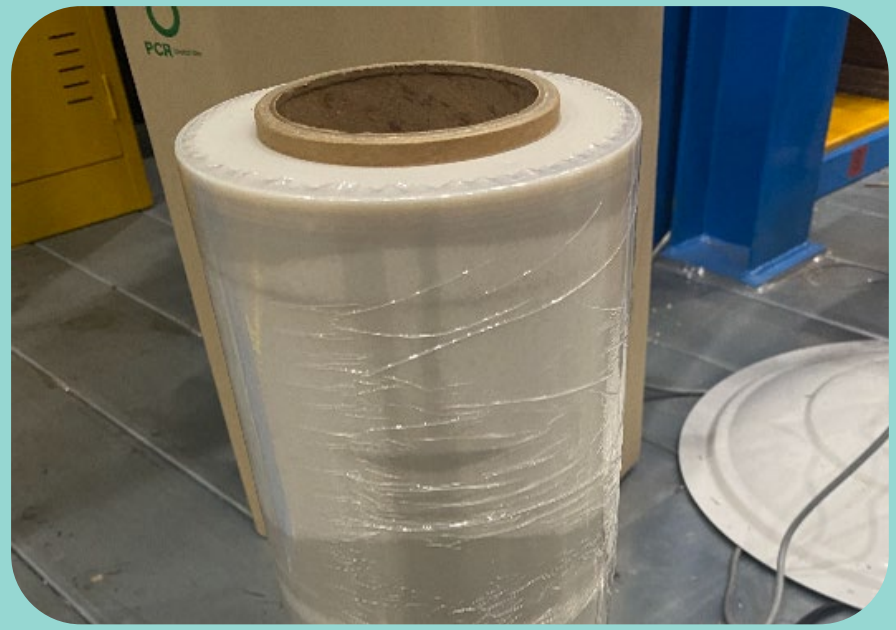
HOW?

- Avoid use of material or treatments that are detrimental to recycling.
- Maximize use of or renewable and/or recycled content.
- Innovate packaging with solutions that maximize reusability or recyclability.
- Provide clear packaging recycling guidance.
- Initiate and develop reuse programs (i.e., pallets, steel drums, etc.).
- Create recycling programs to reduce internal packaging waste.

EXAMPLE

RECYCLED WRAPPING FILM REPLACEMENT

The Liner low-density (LLDPE) wrapping films used at our Sondgo site in South Korea and at our Darmstadt site in Germany have been changed to 30% and 40% recycled content respectively



CASE STUDIES

FOAM PEANUTS REPLACEMENT IN LYON

We replaced biodegradable starch peanuts with crumpled paper as filling material at the Lyon, France Distribution Center. The dunnage consists of 100% recycled paper. This substitution replaces 23 metric tons of foam peanuts annually, representing 2,900 cubic meters, the volume of 4 jumbo jets.

PACKAGING FOR SMALLS IN MILWAUKEE

A smaller box was developed and validated for shipping around 1,000 products daily at our Milwaukee distribution center. The new solution has an air space reduction of over 50%— a reduction of 60 metric tons of packaging materials annually.