

# SUSTAINABLE PLASTIC PACKAGING DESIGN



## HOW TO ENSURE RECYCLABILITY

Recyclability is an important aspect within a circular economy and needs to be considered when plastic packaging is designed.

To achieve recyclability of plastic packaging, it is important to look at the end-of-life phase of the packaging as a crucial parameter during the product design and analyse the local sorting and recycling infrastructure. The sorting infrastructure, automated or manual, has a major impact on the quality of the sorted plastic fractions that would in turn affect the recycling process and the quality of the recycled plastics.

To improve the recyclability of plastic packaging, some rules of thumb are listed below.



## ✓ DOs

### Encourage utilization of monolayer material as a substitute for multilayer material in plastic packaging applications.

Packaging consisting of a mixture of different plastics with varying processing requirements is challenging to recycle or to obtain high-quality recyclates from. In case a combination of different polymers cannot be avoided, only polymers with a significant difference in density must be combined to make the material separation easier during recycling.

If a product contains various parts made of different polymers, they should be easily and completely removable to fully separate the material streams, e.g. a bottle and its lid.

Take into account other packaging options: analyse the ecological footprint of the plastic options and compare it with alternative materials.

Include easily removable labels or substitute them with an eco-friendly print that does not have a negative impact on the sorting or recycling process.

Take into account reuse options such as refilling when designing packaging to reduce single-use plastic products.

Consider well-balanced thickness of packaging material, depending on the application of the product and recycling processes.

Packaging thinness can have a negative impact on material collection processes because thinner plastics become airborne and are easily dispersed via wind and water as opposed to thicker plastics that, in addition, can have a longer lifetime. At the same time, thinner packaging is more ecological due to the consumption of less material.

## ⊘ DON'Ts



### PVC as well as uncommon or rare (co-)polymers and blends (e.g. SAN and EPS) should not be used.

They have negative properties that impact sorting, recycling and energy-recovery processes such as incineration. Particularly with regards to PVC, during incineration the chlorine in PVC could have a negative impact in terms of air pollution and equipment corrosion.



### The use of dark colours in packaging should be avoided.

Dark colours have negative properties that affect optical sorting processes. For example, black and opaque packaging, especially those consisting of carbon black, are difficult to identify during near infrared (NIR) sorting. Dark colour packaging also contaminates the recycling of transparent plastics.



### Low volume packaging containers should be avoided.

Consumption of products packaged in low-volume flexible packaging materials may increase the quantity of packaging waste.



### Unnecessary and superfluous outer packaging materials should be avoided.

**Sustainable packaging design should not be perceived as a burden but as an economic opportunity for brands. It can lead to more customers, higher sales, and brand recognition.**

To learn more about sustainable packaging design, consult the report "Design-for-recycling (D4R) – State of play" (2021) of the GIZ project 'Collaborative Actions for Single Use Plastic prevention in South East Asia'.

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