

## **Design for Recycling (D4R)**

#### Polyco 🖌 D4R Guidelines



Multi-layer Packaging

# Why Design Products for Recyclability?

As a packaging designer, you play a key role in creating packaging that is good for the product, good for people, and good for the planet.

These Design for Recycling (D4R) guidelines have been created to help you to make the best decisions when choosing how to design packaging that keeps the planet in mind. Designing packaging that can be easily recycled keeps that packaging out of landfill and out of the environment. Recyclable packaging re-enters the recycling value chain and can be used again and again, protecting and preserving the natural world.

These guidelines show you which materials are best to use, which materials should be avoided, and what quality criteria to factor in to ensure that your packaging can continue to be recycled in the highest grade possible.

Designing packaging for recyclability does not mean that you have to sacrifice quality or performance. By using these guidelines you will see that you can achieve high quality packaging and recyclability at the same time.



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#### Multi-layer Films, Bags and Pouches

Multi-layer flexible packaging is a problematic packaging that is currently not easy to recycle, particularly when multiple materials or different polymers are used to create the packaging. Understanding the packaging properties that are required for the product for which you are designing packaging for is crucial in being able to select the most recyclable packaging design possible.

#### **BASIC PRINCIPLES**

#### **Ideally:**

Select a mono-material.

#### Avoid:

- Multi-layers if the barrier properties are not needed.
- Multi-material laminates because they can not be recycled together.
- Very thin films because these are overlooked by waste sorters.

#### **QUALITY CRITERIA**

- Use mono-materials, in this case polyolefins.
- Laminate using the same type of polyolefin.
- Use neutral colours, clear or white is preferred.
- Compatible materials can be recycled together. For example, PP (various formats) and LDPE would be recycled within the PP film waste stream.







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#### Laminated Multi-layer Packaging Films

#### **UNDERSTANDING THE MATERIAL**

- Laminated films are manufactured to create a barrier to protect the product from light and moisture, lock in the products flavour, or prevent gases (including odours) entering or escaping from the product.
- This barrier property is often required for extended shelf life, for food safety or for the protection of the contents.
- Lamination is required where one or more of the materials cannot be manufactured in the same process as the rest of the layers. For example, paper, aluminium foil, BO-PET, BOPP or metallised BOPP.
- Multi-layer laminated films should only be manufactured if no other form of packaging will be sufficient or effective.
  Mono-material packaging films should always be first choice.
- Mono-material and compatible material multi-layers will not be differentiated from non-recyclable multi-layers and specialised collection systems will need to be in place to ensure collection and recycling there-of.

# Multi-layer Laminates\*



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#### 2 Co-extruded Multi-layer Packaging Films

#### UNDERSTANDING THE MATERIAL

- Co-extruded films are manufactured to create a barrier for moisture and/or oxygen.
- Co-extrusion is only possible if all the materials can be simultaneously shaped in its molten form into a sheet or film.
- The barrier property is often required for extended shelf life, for food safety or for the protection of the contents.
- Multi-material co-extruded films should only be manufactured if no other form of packaging will be sufficient or effective.
  Mono-material packaging films should always be first choice.
- Compatible multi-layer materials will only be "picked" where formal collection systems are in place and education of pickers has been implemented because the used packaging is difficult to differentiate from non-compatible multi-layer films.







### Multi-layer Co-extruded Films\*



\* Generic example and represents all multi-material co-extruded films

Polyco (the Polyolefin Responsibility Organisation NPC) is focused on making waste a valuable resource that works for our economy. We aim to grow the collection and recycling of polyolefin plastic packaging in South Africa and to promote the responsible use and reuse of this plastic packaging. Our mission is to reduce the amount of plastic packaging going to landfill and to end plastic waste in the environment. Polyco does this by collaborating with multiple stakeholders, by investing in recycling innovation and infrastructure in South Africa, and by educating both the industry and the consumer about recycling.

We hope you have found these Design for Recycling Guidelines helpful. If you have any comments or queries please contact us.