Plastics are useful materials for a wide variety of applications, but the quantity of waste produced from them is also increasing. In 2018, close to half of plastic recyclates used in new products in the construction sector are long life. This open-loop recycling can be seen as desirable.

What do we mean by ‘food grade’?

Plastics often contain additives: chemicals that improve particular properties, such as colour, stability, and durability. Some common additives are:

- Antioxidants: help stabilise the recycled product, ensuring it is fit for purpose and/or improving its shelf life.
- Plasticisers: help plastic materials soften and reduce rigidity, making it easier to process and form into different shapes.

Limitations of mechanical recycling

Mechanical recycling is the most cost-effective method of recycling plastic, but it does have its limitations. One major drawback is that it makes sorting and separation a challenge, as different plastics have similar properties. For example, HDPE and LDPE are both polyethylene, but they have different densities and thus require different methods to separate.

What kind of products are made from mechanically recycled plastic?

Mechanical recycling can be used to create a wide range of products, usually non-food-grade. Some examples include:

- Shampoo or detergent bottles
- Reusable crates and pallets
- Flower pots, seed trays, watering cans, and water butts
- LLDPE for a variety of films

Where mechanical recycling really works

Mechanical recycling is suitable for a variety of plastic products, such as:

- High-density polyethylene (HDPE) for milk bottles, containers, and packaging
- Low-density polyethylene (LDPE) for a variety of films
- Polypropylene (PP) for food packaging
- Polyvinyl chloride (PVC) for building products

Materials in production, and in fact for some polymers this is the case. However, experts are working on ways to improve the quality of recycled plastic, and there are already some promising solutions.

What different polymers are there?

Plastics are made from various polymers, each with different properties and uses. Some common polymers include:

<table>
<thead>
<tr>
<th>Polymer</th>
<th>Uses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polyethylene</td>
<td>Milk bottles, containers, LLDPE films</td>
</tr>
<tr>
<td>Polypropylene</td>
<td>Food packaging</td>
</tr>
<tr>
<td>Polyvinyl chloride (PVC)</td>
<td>Building products</td>
</tr>
</tbody>
</table>

The quality of recycled plastic can vary depending on the polymer type. For example, HDPE and LDPE have different densities and thus require different methods to separate.

Where to find out more

- [Mechanical recycling](https://www.epa.gov/recycling/mechanical-recycling)
- [Plastics and the Environment](https://www.epa.gov/plastics/plastics-environment)