

# THE 'DISS'-TINCTIVE ART OF PLASTIC RECYCLING

## Dissolution recycling explained

Dissolution is a solvent-based process in which a targeted polymer can be selectively dissolved, separated from its additives and composites and purified from a sorted plastics waste fraction.

### HERE'S HOW IT WORKS

#### 1. COLLECTION

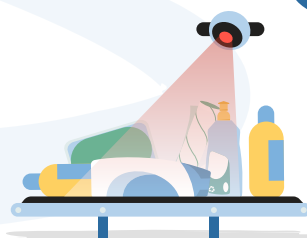
Plastic waste is collected separately, with other plastic, or mixed with metal and paper, etc.



Dissolution recycling falls under physical recycling technologies.

#### 2. SORTING

Current technologies like Near-Infra-Red (NIR), Visual Inertial System (VIS) and/or emerging technologies, like Artificial Intelligence (AI), sort the waste by material and product type. During this step, the plastic is placed on a conveyor belt, just like the one at the checkout of a supermarket!



#### 3. GRINDING & WASHING

Sorted plastic waste is cleaned for processing. This involves shredding the plastics into smaller pieces and removing contaminants like labels, adhesives, or product residues through washing.



POLYMERS

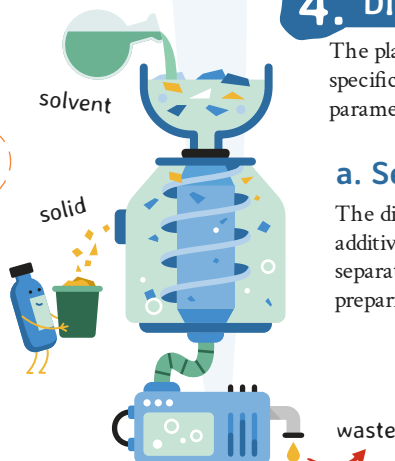
During dissolution, the length of the plastic polymer chain remains unchanged.

#### 4. DISSOLUTION

The plastic waste is mixed with a solvent targeting a specific polymer in a controlled environment, where parameters such as temperature and pressure are defined.

##### a. Separation

The dissolved polymer and insoluble contaminants (e.g. additives, fillers) are separated by applying mechanical separation such as filtration or centrifugation, like when preparing fruit juice!

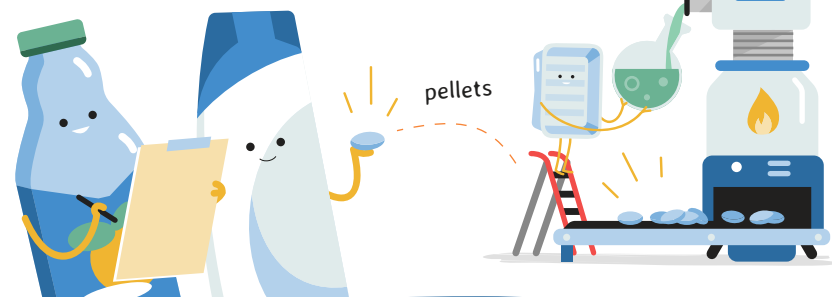


##### b. Purification

In the dissolved state, the polymer will undergo additional purification steps, which allow the removal of other contaminants depending on the thresholds for the final application.

##### c. Recovery of Solvent & Extrusion

The solvent containing the dissolved polymer is recovered from the solution. This allows for the reuse of the solvent in subsequent recycling cycles, reducing waste and cost. As a final step, the polymer is then extruded into pellets.



To ensure the highest technical and regulatory standards are met, the recycled polymer goes through a final quality check before being turned into a new product!