

### Not All Types of Recycling Were Created Equal (But They Are All Important)

Many people wonder what happens to the materials that they place in their recycling bin. There are three main types of recycling that post-consumer materials can undergo. Each has specific advantages and end products.

**Primary recycling**, often referred to as “closed loop recycling”, is when recyclable materials are mechanically processed to create a product that serves a similar function. For example, a post-consumer plastic bottle can be mechanically processed to create a new plastic bottle. This bottle has similar strength and performance characteristics as the original bottle. Some materials, such as aluminum and glass, can be recycled in this closed loop system an infinite amount of times. No matter how many times these materials are recycled; their material quality will not decrease. A glass bottle made with glass that has been recycled 20 times will perform just as well as a bottle made of new glass.

The quality of other materials, such as paper and plastic, decreases each time they are recycled. The strength of paper comes from the tangling of pulp fibers. Each time a paper product is recycled, these fibers become shorter, until they become so short they are unable to be used to create new paper. The EPA estimates that paper can be recycled a maximum of five to seven times. Plastic recycling fares worse. The polymers that make up plastics also are shortened each time the material is recycled, and it is estimated that plastic can only be recycled one to two times before the quality of the material is diminished.

This is where **secondary recycling** comes in. Secondary recycling is still a mechanical recycling process, but it uses recycled materials to make a new product. This new product typically does not have the same physical demands as the original product and is often less recyclable. Despite the decrease in recyclability, this is an important process to minimize the use of virgin resources and to help divert less recyclable materials such as plastic from landfills. An example of secondary recycling is plastic bottles being turned into polyester.

The third type of recycling is **tertiary recycling**. In tertiary recycling, recycled materials are used as a feedstock in a process to create chemicals and fuels. These chemicals can then be used to create new materials. This type of recycling typically uses the most energy, costs more, and can have the same negative environmental impacts of producing brand new materials. The benefits are reducing waste that is landfilled and minimizing new resources that are used to create chemicals. An example of tertiary recycling is the glycolysis of PET plastic into diols and dimethyl terephthalate to make virgin PET plastic.

**Municipal and state regulations require that residents, commercial establishments and non-residential establishments recycle all recyclable materials. Commonly recycled materials include paper, plastic, glass and metal. You should check with your hauler for a complete list of acceptable recyclable materials.**