

## How Plastic Bottles Are Turned Into Clothes

Plastic bottles are collected from the public using bottle banks or kerbside collection schemes. The collected bottles are delivered to sorting centres, often termed Materials Reclamation Facilities (MRFs) where they are separated into three different plastic types (polymers). The three types are HDPE, PVC and PET. It is the PET bottles that are mainly used to produce fibre products. These bottles are typically used to produce fizzy or soft drinks bottles. They are transparent and have a small “dot” in the base of the bottle.

The sorted bottles are compressed into dense bales and shipped to a reprocessing plant. Each shipment typically comprises of around 300,000 bottles.

At the reprocessing plant the bales are loaded into a de-baling machine which loosens the squashed bottles. These are loaded onto a conveyor, which carries the bottles through inspection equipment that removes any remaining non-PET bottles from the stream. The plastic bottles are then chopped into small flakes whilst in a water bath. This “wet granulation” process helps clean the bottles and removes the label. Floatation equipment is used to separate the PET from another plastic material used to produce the bottle caps. The flakes of PET are finally drained of water and dried. An air blower system transports the flakes into storage containers, and helps blow out any remaining dust or small pieces of label.

To produce the fibre, this flake material is melted and squeezed through spinnerets. These are flat plates with many tiny holes. As the molten plastic emerges from the spinneret it solidifies. The melt spinning produces many long strands of individual fibres, known as an “undrawn tow”. The undrawn tow is then brought together in a single thick tow. This collection of fibres is then drawn. The drawing process stretches the fibres to several times their original length.

The fibres, now stretched, are crimped to introduce a “wave” into the fibre. The wave is set in the fibre by heating. Finally, the fibre is cut into specific lengths. The final use of the fibre is one factor in determining the choice of length of fibre.

To make fleece clothing the fibres are spun into a yarn. The yarn is then woven to produce rolls of fleece material. This material is cut to shape and sewn to make a new garment.



Plastic bottles (PET)



PET bottle and fibre



Fleece jacket made from recycled PET bottles