

How long does it for PET (polyethylene terephthalate) bottles to biodegrade?

- A. 150 years
- B. 250 years
- C. 450 years**
- D. 1000 years



PET is a ubiquitous material used in diverse applications from drink bottles and film to shirts and fabrics. It cannot be decomposed through biodegradation in the same way as organic materials can. It takes more than 30 years to decompose a plastic film container and about 450 years for a plastic beverage bottle (PET). PET undergoes very slow into small particles through photo-, physical, thermal, chemical, and biological degradation processes.

PET has a resin identification code of 1. PET is referred to by its common name, polyester, whereas the acronym PET is generally used in relation to packaging. In 2016, it was estimated that 56 million tons of PET (polyethylene terephthalate) are produced each year.

While most thermoplastics can, in principle, be recycled, PET bottle recycling is more practical than many other plastic applications because of the high value of the resin and the almost exclusive use of PET for widely used water and carbonated soft drink bottling. PET comprises 6.5% of European plastic demand—an excess of over 3,000 tonnes. More than 50% of synthetic fibres produced around the world consist of PET, and global consumption of PET has been reported to exceed \$17 billion per year

Japanese scientists have isolated a bacterium *Ideonella sakaiensis* that possesses two enzymes which can break down the PET into smaller pieces that the bacterium can digest. A colony of *I. sakaiensis* can disintegrate a plastic film in about six weeks.

More information can be found at:

Webb,H.K. et. al. *Polymers* **2013**, 5, 1-18

Yoshida. S. et. al. *Science* **2016**, 351, 1196-99

Kubowicz, S. *Environ. Sci. Technol.* **2017**, 51, 12058-12060