

Oxo-degradable plastics - Q&A

What are oxo-degradable plastics? How can I tell if I am using one?

Oxo-degradable plastics are conventional plastics made from petrochemicals (usually polyethylene (i.e. PE)). The difference is that oxo-degradable plastics have small concentrations of additives (usually metal salts) that cause them to degrade at an accelerated rate. These plastics will usually be labelled as 'degradable', 'oxo-biodegradable' and sometimes even 'biodegradable' or 'oxo-biodegradable'.

Are oxo-degradable plastics the same thing as bioplastics or bio-based plastics?

No. Bioplastics (or bio-based plastics) are made from renewable resources like cornstarch, while oxo-degradable plastics are made from petrochemical substances (i.e. fossil fuels). Some types of bioplastics are biodegradable but not all of them are. Those bioplastics that are biodegradable are usually compostable, meeting international standards such as EN13432, whereas oxo-degradable plastics are not compostable.

How do oxo-degradable plastics degrade?

Oxo-degradable plastics degrade when exposed to heat and/or light. The additives serve to initiate and accelerate break-down of the plastic by a process known as 'oxidative degradation'. Exposure to heat and/or light causes the molecules to break apart so that the plastic weakens in strength, becomes brittle and fragments into small pieces. The time taken for the plastic to start to degrade will depend on the amount of additive in the plastic and the type of environmental conditions it is exposed to. Therefore, it is not possible to accurately predict when the plastic will start to degrade, but it will usually start to occur within 2-5 years in the UK.

Will oxo-degradable plastics (e.g. bags) degrade in my home?

Yes. As the plastics degrade when exposed to heat and/or light the plastics do not need to be buried in the ground to degrade – they will degrade in the open air. You will start to notice the plastic breaking up, with small pieces of plastic fragmenting from it. If this begins to happen, we suggest that you put what remains of the plastic in your rubbish bin.

Do oxo-degradable plastics biodegrade? Does that mean that I compost them?

Oxo-degradable plastics are often described as biodegradable, and indeed tests have shown that oxo-degradable plastics can biodegrade to some extent under certain conditions. However, it is unclear how long it takes for oxo-degradable plastics to biodegrade, or whether they biodegrade completely. This means that you should not compost them because it will result in fragments of plastic in the compost that have not completely biodegraded. To be totally sure the plastic you are buying is compostable, you should look for the following logos:



012345/AB



**compostable
EN13432**

The logo on the left certifies that the material is home compostable, and the logo to the right certifies that the material is suitable for industrial composting.

What is the difference between degradability, biodegradability and compostability?

Biodegradation is a process where micro-organisms, such as bacteria and fungi, metabolise substances and break them down to simple molecules (i.e. carbon dioxide and water). For a plastic to biodegrade it must first start to fragment into smaller pieces (i.e. degrade). The difference between degradation and biodegradation is that biodegradation is caused by the action of living organisms, whereas degradation is not. Biodegradation is an important process for composting. To be compostable a plastic must biodegrade within 180 days to leave no leaves no visible, distinguishable or toxic waste.

Is there a solution to the plastic bag problem?

In accordance with the waste hierarchy 'reduce, re-use, recycle', the best thing you can do is minimise the number of new bags you use (whatever material they are made of), by remembering to reuse old carrier bags or to buy and use a reusable bag. Reusable bags have a lower environmental impact than single-use bags, but only if they are reused several times. And, once they are no longer usable they should be disposed of correctly. Some stores take back bags once they are damaged or worn out and replace them with new ones.

Our research shows that the disposal of oxo-degradable plastics bags may pose several difficulties. The bags cannot be composted and there are also concerns about the effects of the plastic in recycling facilities.

Should I recycle oxo-degradable plastics?

The additives used in oxo-degradable plastics may contaminate the recycling system, acting to weaken the quality of recycled product. This impact can be negated by adding a stabiliser to plastics that are recycled, but our research shows that this can be problematic for recycling companies who may not know what proportion of plastics contain the additive and, therefore, what quantity of stabilisers should be added. Therefore, our research suggests that oxo-degradable plastics should not be recycled.

How should I dispose of oxo-degradable plastics that are labelled degradable or biodegradable?

Our research suggests that the best way to dispose of oxo-degradable plastics is in landfill or in incineration facilities. Therefore, we would suggest that you dispose of them in your normal rubbish bin, rather than recycling or composting them.

Do oxo-degradable plastics degrade in landfill?

It is difficult to know whether oxo-degradable plastics fully degrade in landfill, as it depends on the environmental conditions the material is exposed to. If they are on the surface of a landfill site for enough time (i.e. with plenty of air) it is likely they will start to degrade. If they end up further down in the landfill, where there is no air, they may not break down at all.

Are the oxo-degradable additives (i.e. metal salts) toxic to the environment?

Our research shows that the metal salts contained within oxo-degradable plastics are at such low concentrations that they are unlikely to be toxic to the environment.

What happens to the fragments of oxo-degradable plastic if they do not fully biodegrade?

There is very little research that assesses what happens to oxo-degradable plastic fragments in the natural environment. It is, therefore, better to dispose of these plastics carefully in a normal rubbish bin.