



# THE EU SINGLE-USE PLASTICS DIRECTIVE 2019/904

Oxo-degradable v Oxo-biodegradable





On 20th June 2025 Symphony received approval for d<sub>2</sub>w from the Environmental Protection Agency of the Republic of Ireland, a member of the European Union as follows:



Following a thorough review of the submitted documentation and relevant scientific studies, we can confirm that d<sub>2</sub>w products do not contain Oxo-degradable materials as defined by Directive (EU) 2019/904, which prohibits the use of Oxo-degradable plastics due to their contribution to microplastic pollution.

The dew technology is classified as Oxo-biodegradable, involving both oxidative and microbial degradation processes that result in full biodegradation without leaving toxic residues or persistent microplastics. This distinction is supported by independent studies and aligns with the objectives of the Directive to reduce plastic pollution and promote sustainable alternatives.

Furthermore, we have reviewed the Commission Notice (2021/C 216101) published in the Official Journal of the European Union on 7 June 2021, which provides guidelines on the implementation of Directive (EU) 2019/904. The Notice confirms that the Directive applies to all products made from Oxo-degradable plastics. Based on the evidence submitted, we are satisfied that d<sub>2</sub>w products do not fall within this category, as they are designed to undergo full biodegradation without leaving microplastics. Therefore, they are not subject to the restrictions outlined in the Directive or its accompanying guidelines.

Accordingly, we are satisfied that the materials in question do not fall under the scope of concern for Oxo-degradable plastics. We therefore confirm that there is no objection to the distribution of dew products in Ireland, and we consider this investigation closed.



This accords with written advice received by Symphony Environmental Technologies Plc from Joshua Holmes KC of Monckton Chambers, a specialist in EU law, that: "Oxo-biodegradable plastic: falls outside the definition of Oxo-degradable plastic contained in Article 3(3); and is therefore not subject to the Article 5 Prohibition."

### BACKGROUND

This prohibition was not in the draft Directive submitted to the EU Parliament by the EU Commission. The Commission had asked their scientific experts, the European Chemicals Agency (ECHA), to study Oxo-biodegradable plastic, but they had not yet completed their studies and submitted their report. Instead of waiting for ECHA to report, the Environment Committee (who are not scientific experts) amended draft Article 5 to include a ban on what they described as “Oxo-degradable” plastic. None of the reports to that Committee from their own Rapporteurs had given any scientific justification for a ban.

#### **The reasons for the ban are set out in Recital 15 “that type of plastic:**

- (a) does not properly biodegrade and thus
- (b) contributes to microplastic pollution in the environment
- (c) is not compostable
- (d) negatively affects the recycling of conventional plastic and
- (e) fails to deliver a proven environmental benefit.

*As to (a) the EU Parliament has never defined what it means by “properly” biodegrade, and has never said what it would regard as a reasonable timescale for biodegradation.*

If an Oxo-biodegradable plastic is proved to biodegrade in the open environment according to ASTM D6954, the industry-standard for “Plastics that Degrade in the Environment by a Combination of Oxidation and Biodegradation” it does “properly” biodegrade. The most recent scientific work is the four-year OXOMAR study at the French marine laboratory. [www.biodeg.org/wp-content/uploads/2021/07/Final-report-OXOMAR-10032021.pdf](https://www.biodeg.org/wp-content/uploads/2021/07/Final-report-OXOMAR-10032021.pdf)

The scientists said: “We have obtained congruent results from our multidisciplinary approach that clearly shows that Oxo-biodegradable plastics biodegrade in seawater and do so with a significantly higher efficiency than conventional plastics. The oxidation level obtained due to the d<sub>2</sub>w prodegradant catalyst was found to be of crucial importance in the degradation process.”

By contrast, ordinary plastics and biobased plastics will not properly biodegrade in the open environment, but they are not banned.

**As to (b) Microplastics** - conventional plastics will fragment when exposed to sunlight, and they are the principal source of micro plastic pollution in the environment, but they are not banned. Oxo-biodegradable plastics convert not into fragments of plastic but into waxy substances which are biodegradable.

See <https://www.biodeg.org/subjects-of-interest/microplastics/>

On 30th October 2018 ECHA advised the Biodegradable Plastics Association that it was not convinced that oxo-biodegradable plastic creates microplastics.





*On 22nd August 2018 ECHA advised the EU Commission that:*

Irrespective of their source, microplastics are persistent and universal pollutants. When products containing them are used, microplastics can be released to the environment where they stay for centuries, as they do not biodegrade.”  
So if they do biodegrade they are not microplastics.



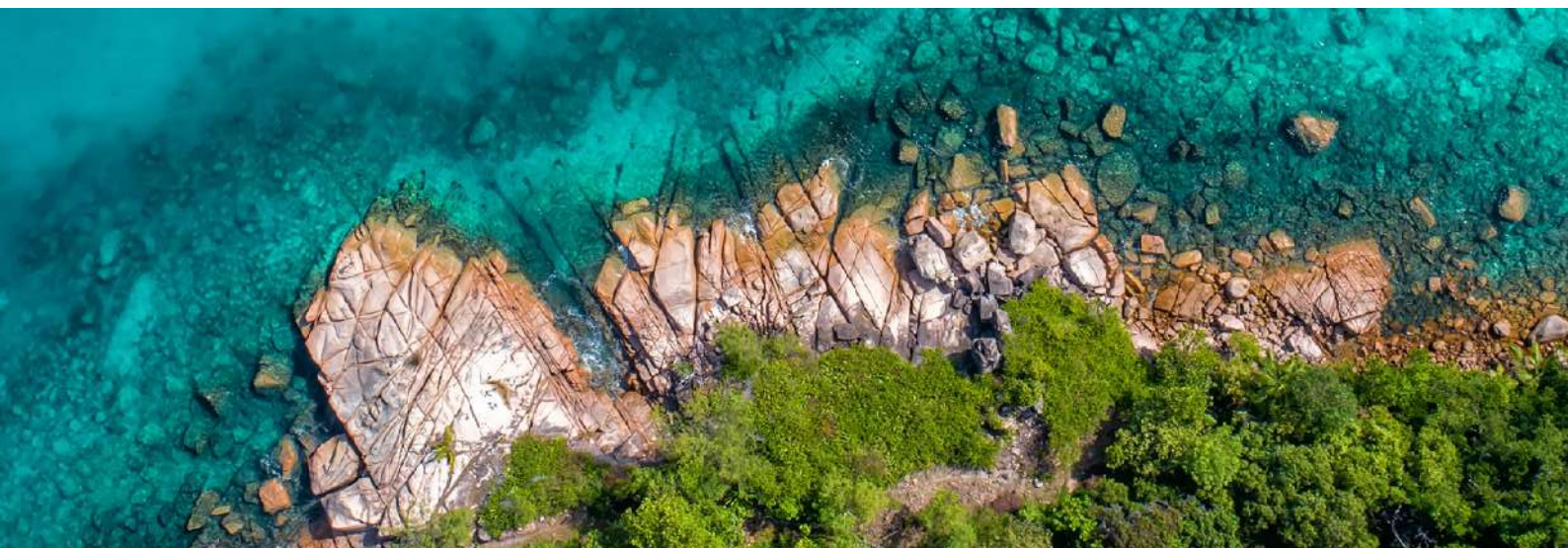
<https://echa.europa.eu/documents/10162/db081bde-ea3e-ab53-3135-8aaffe66d0cb>

As to (c) - **compostability**. Conventional plastics are not compostable but they are not banned. Oxo-biodegradable plastics have been independently tested according to ISO 14855, and also in real-world industrial composting, and found to be compostable. In any event no reason is given by the European Parliament why compostability should be relevant to a ban. On the contrary, plastics do not convert into compost – they convert into CO<sub>2</sub> and have no useful role in the composting process - see <https://www.biodeg.org/subjects-of-interest/composting/>

As to (d) **recycling**, it is well known that bio-based “compostable” plastic will contaminate a recycling stream, but it is not banned. By contrast, Oxo-biodegradable plastic has been safely recycled for many years, including by the largest bread manufacturer in the Western world, and there are reports from three expert test-houses which confirm recyclability - See <https://www.biodeg.org/subjects-of-interest/recycling-2/>

As to (e) **environmental benefit** - if an Oxo-biodegradable plastic is tested to biodegrade in the open environment without leaving microplastics, and thereby reduces the overall burden of plastic pollution, it delivers an obvious environmental benefit.

The prohibition in Art 5 would not be expected to apply to a type of plastic which did not fall within the reasons for the ban set out in Recital 15.



## ARTICLE 3(3) definition



“Oxo-degradation” is defined by the EU Standards experts (CEN) in TR15351 as “degradation resulting from oxidative cleavage of macromolecules.” This describes plastics, which abiotically degrade by oxidation in the open environment and create microplastics, but do not become biodegradable, except over a very long period of time. Instead of using the scientifically accurate definition of oxo-degradation, the EU Parliamentary Committee invented its own definition, which has caused confusion. In Art 3(3) of the SUP Directive Oxo-degradable plastic is defined as “plastic materials that include additives which, through oxidation, lead (i) to the fragmentation of the plastic material into micro-fragments or (ii) to chemical decomposition.”



The definition in Art. 3(3) bears no relation to the reasons for the ban given in Recital 15. It focusses only on (i) chemical decomposition, and (ii) micro-fragments

It is well known that conventional plastics often contain additives such as colorants which cause them to oxidise and fragment into microplastics. The definition in Art 3(3) does not say that the additives must have been deliberately added for the purpose of causing oxidation, and if strictly applied it therefore applies to a wide range of conventional plastics.

In the case of Oxo-biodegradable plastic, the degradation is caused by the reduction in the molecular weight of the polymer, and Symphony have evidence from their own scientists and from Professor Jakubowicz, one of the world's leading polymer scientists, that this is not chemical decomposition.

Symphony has also received scientific evidence from **Jordi Labs, a specialist laboratory in the United States** that (a) oxidation would occur in the absence of the d<sub>2</sub>w masterbatch, and the masterbatch does not therefore lead through oxidation to the fragmentation of the material – it simply controls the rate of oxidation, and (b) oxidation does not result in chemical decomposition.

This laboratory specializes in polymer analysis and has more than 40 years' experience performing regulatory, quality control and failure testing. They are one of the few laboratories in the United States specialized in this type of testing.

## CONCLUSION

**d<sub>2</sub>w biodegradable plastic falls outside the definitions contained in Recital 15 and Articles 5 and 3(3) of the Single-use Plastics Directive 2019/904 and is not prohibited in the EU. This has been officially confirmed in the Republic of Ireland, a member-state of the EU.**



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