

## Biodegradation and Ecotoxicity of Polyethylene Films Containing Pro-Oxidant Additive

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O mais recente estudo realizado no mundo, seguindo a norma internacional ASTM D6954-04, comprova biodegradação e ausência de ecotoxicidade dos plástico contendo aditivos pró-degradantes.

Os plásticos foram coletados no mercado e submetidos a testes. Todos os requisitos previstos na norma foram satisfeitos.

Os plásticos biodegradáveis testados e aprovados foram produzidos com aditivos e tecnologia d2w – Symphony ( tecnicamente denominados oxibiodegradáveis ). Distribuídos no Brasil pela RES Brasil. d2w também é aprovado e certificado segundo norma ABNT PE-308.01 acreditada pelo INMETRO, assim como está em conformidade com os critérios da OPA ( [The Oxo-Biodegradable Plastics Association](#) ), Instituto IDEAIS, além da norma BS 8472 e da União Europeia EN 13432 para requisitos de degradação, biodegradação e ausência de resíduos nocivos.

Associados do IDEAIS tem acesso gratuito ao estudo completo. Solicite caso tenha interesse. Abaixo resumo do estudo em inglês.

### Abstract

The worldwide accumulation of non-degradable plastic materials, such as plastic bags, is one of the most important environmental concerns nowadays. The use of degradable materials is an option to mitigate the environmental impact generated by the consumption of plastics. One of the technologies used for the manufacture and use of degradable plastics is the use of pro-degradant additives that are incorporated in conventional plastics to promote their degradation under certain conditions. The aim of this study is to evaluate the process of oxidation, biodegradation and potential ecotoxicity of polyethylene films containing an oxo-degradable additive, according to the standard ASTM D-6954. This method establishes a procedure in which the samples are subjected to consecutive steps of accelerated oxidation, biodegradation by composting and ecotoxicity assessment. Furthermore, the effect of the presence of printing ink in the polyethylene samples with oxo-degradable additive was evaluated, and the results were compared with those obtained for samples of conventional polyethylene and polylactic acid. After 180 days of laboratory controlled composting, the samples reached the following percentages of biodegradation: polylactic acid, 41 %; printed oxo-degradable polyethylene, 32.24 %; oxo-degradable polyethylene, 25.84 %; printed polyethylene, 18.23 % and polyethylene, 13.48 %. The cellulose sample used as a control was mineralized in 58.45 %. Ecotoxicity assessment showed that the products of biodegradation of the samples tested, did

not generate a negative effect on germination or development of the vegetal species studied. Under proper waste management conditions, these plastics can be used as an option to decrease the environmental impact of plastic films.

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