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Standards

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Plastics - Biodegradable plastics in or on soil - Recovery, disposal and related environmental issues

S.R. CEN/TR 15822:2009

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English Version

Plastics - Biodegradable plastics in or on soil - Recovery, disposal and related environmental issues

Plastiques - Plastiques biodégradables dans et sur les sols
- Valorisation, élimination et problèmes environnementaux
associés

Kunststoffe - Bioabbaubare Kunststoffe in oder auf Böden -
Verwertung, Entsorgung und verwandte Umweltthemen

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Foreword

This document (CEN/TR 15822:2009) has been prepared by Technical Committee CEN/TC 249 "Plastics", the secretariat of which is held by NBN.

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Introduction

Biodegradable plastics are a broad class of materials, encompassing various types of very different polymers and final products, which have been classified in different ways.

CEN/TC 249/WG 9 has previously prepared a Technical Report [1], intended to harmonise the terminology to be used in the field of degradable and biodegradable polymers and plastic items. It is based on scientific considerations and on a technical analysis of the various stages and mechanisms involved in the degradation of plastics; its use should help to avoid misleading claims or statements and to increase the knowledge in the field.

It should be clear that, as for any other material, the overall environmental impact of using biodegradable plastics, and the related environmental issues, should be assessed on the basis of their entire life cycle in a given system, e.g. according to the requirements of EN ISO 14040 series of standards on Life Cycle Assessments. Furthermore, the communication of the results of such assessments is governed by other ISO standards (e.g. EN ISO 14020 series on Environmental Labels and Self-claims, ISO 14063 on environmental communication).

All of these standards aim to harmonise the approaches to environmental issues, and play an important role in preventing confusion in the mind of target audiences.

In the perspective of sustainability, it is also important to note that the environmental dimension and related issues are only one of the three dimensions which need to be considered, the others being social and economic dimensions.

1 Scope

This Technical Report is intended to summarise the current state of knowledge and experience in the field of biodegradable plastics which are used on soil or end up in soil. It also addresses the links between use, disposal after use, degradation mechanisms and the environment.

Therefore, this document is intended to provide a basis for the development of future standards. Its aim is to clarify the ideas and ensure a level playing field, without hiding possible needs for further research or areas of disagreement among experts.

2 General background

During the last decade several standardisation activities have been undertaken to characterise the behaviour of biodegradable polymers when exposed to composting conditions. A group particularly active in Europe was CEN/TC 261/SC 4/WG 2 (Packaging and environment/Organic recovery). The activity of this group was restricted to biodegradability and compostability of packaging. Other applications or other biodegradation environments were not addressed. This was due to the limits of the mandate given to CEN by the European Commission [2]. The standards to be developed were intended to give presumption of conformity with the essential requirements of the packaging and packaging waste directive [3] relating to biodegradability and compostability of packaging claimed to be "recoverable in the form of organic recovery" (i.e. composting and biogasification).

The resulting European Standard EN 13432 was finalized in 2000. This standard defines the requirements for composting of packaging; a new European Standard dealing with the evaluation of the compostability of plastics (EN 14995) has been completed recently.

In other applications of plastics, however, composting is not likely to be the final treatment. Several plastic materials and products have been designed for applications ending up in or on soil. They have been developed for applications where biodegradation is beneficial from a technical, environmental, social or economic standpoint. Examples can be found in agriculture (e.g. mulching film), horticulture (twines and clips, flower pots, pins, etc.), funeral items (e.g. body bags), recreation (e.g. plastic "clay" pigeons for shooting, hunting cartridges), etc. In many cases recovery and/or recycling of these plastic items is either difficult or not economically viable; various types of biodegradable plastics have been developed which have been designed to biodegrade and disappear in situ after their useful life.

So far, it has not been possible to reach a consensus on a single testing scheme to be applied to biodegradable plastics for such applications. The issue of "pre-treatment", i.e. exposure of specimens to light/heat realistically representing the field conditions, before testing the biodegradation in soil, has caused much discussion between involved parties.

Long-term effects, like the possible persistency and bio-accumulation of the remaining fragments or the release of harmful degradation species or of additives like heavy metals or metal compounds are also of concern.

However, there is general agreement that soil cannot be considered as a dumping location for plastic particles, no matter if they are proven safe, with no adverse effects on terrestrial or aquatic organisms, and if they are invisible.

Standards which define biodegradable plastics suitable for degradation in soil are important for industry, users and all stakeholders. It is important, for the development of such standards to refer to the findings of science and to robust evidence based on field experience as well as to identify the needs for further research and possible environmental improvement of products. This is a prerequisite for ensuring a "level playing field" for all biodegradable products. The only standard that currently exists is the French NF U 52-001:2005, *Biodegradable materials for use in agriculture and horticulture — Mulching products — Requirements and test methods*.

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