TECHNICAL INFORMATION SHEET 9

The efficacy of Reverte oxo-biodegradable masterbatches and the time frames of the process.

"It has been well known for many years that the presence of certain metal ions in polymers such as polyethylene and polypropylene can accelerate the degradation of these polymers.

In the presence of oxygen the metal ions catalyse the breakdown of the polymer, causing oxidative chain scission and subsequent polymer embrittlement and degradation.

When the polymer molecular weight is sufficiently reduced it becomes available for microbial attack which further breaks down the polymer into Carbon dioxide, water and biomass.

This primary phase occurring in the process is oxidative chain scission which results in embrittlement and fragmentation through the action of light and heat.

The secondary phase is the soil based microbial attack resulting in breakdown to Carbon dioxide, water and biomass.

This complete process is known as oxo-biodegradation. Reverte products are unique because they are formulated to control the reaction kinetics and additionally contain a secondary biodegradation initiator to speed up the secondary biodegradation phase.

Once a plastic article containing an appropriate Reverte product is exposed to light and heat then the primary phase is catalysed. This phase is normally delayed for between 3 and 9 months depending on the level and type of Reverte addition, the initial light intensity and the ambient temperature. This delay is known as the "dwell time".

Once the dwell time is over the product will commence embrittlement. This phase would normally take a further 3 to 9 months, depending on the additive level and the ambient conditions.

The final phase of biodegradation would normally occur in a further 6 to 18 months, again dependent on the additions employed and conditions experienced.

Reverte products have been designed to introduce an oxo-biodegradable property to plastic products. To do this the product must experience an adequate dose of UV light and sufficient warmth to maintain the reaction. As long as this occurs we can confirm that this is what they will do, but that their precise performance will be dependent on the natural conditions of light and temperature experienced in the region and application in which they are employed."

Andrew Barclay
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