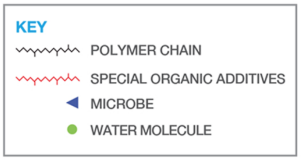
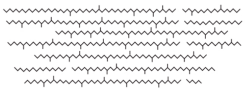
otratex

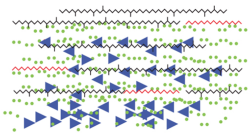
The revolutionary technology behind enhanced degradability

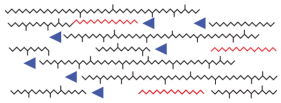
How Does It Work?

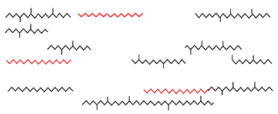
Plastics (or polymers) are long molecular chains of molecules called monomers. Polymers do not exist naturally and are often designed to be incredibly stable. As a result of this powerful infrastructure the Polymers do not biodegrade and are known to last centuries or possibly forever in our environment. Otratex™ offers a solution by incorporating additives into the formula which enhance the biodegradation. Through a series of chemical and biological processes in anaerobic (oxygen lacking) landfills, Otratex™ will eventually decompose. The active landfill is a catalyst for the chemical reaction that allows Otratex™ to be consumed by the microbes in the soil as an energy source. Otratex™ to be consumed (as a food energy source) by the microbes.











1. Microbes and Biofilm

Microbes are microorganisms that exist all around us. In a microbe-rich environment (like an nutrient-rich landfill) Otratex™ attracts these microbes, and they begin to colonize on the material's surface. The microbes secrete an enzyme rendering the Otratex™ hydrophilic (water-attracting).This process results in a microbe-and-moisture-rich biofilm to adhere to the Otratex™ - the perfect environment for the Microbes to hydrolyze - and eventually decompose - the Otratex™ material.

2. Expansion of the Polymer Matrix

The aggressive accumulation of water expands the material, now providing the microbes with direct access to the hydrocarbon polymers once reinforcing the material together.

3. Quorum Sensing

The microbes break down the larger polymer chains into simple organic material for consumption by the microbes. During this breakdown process the microbes secrete signaling molecules that other microbes can detect. This invitiation to others to join the feast is called quorum sensing.

4. Nothing Goes to Waste

With different types of microbes joining the party, each one is attracted to different elements of the polymer and the by-products of the intermediate biological reaction. Certain enzymes begin reducing the complex polymer branching while others look for bulkier chains similar to fatty acids. A syntropic environment containing a diverse species of microbes is estabilished to continue the complex chemical steps of degradation. Throughout this process, microbes continue to multiply.

5. Final Stages of Breakdown

This degradation continues until every chain is reduced to its raw elements, individual polymer chains degrade into biomass (humus) and bio-gases (methane and carbon monoxide). The methane is captured for energy use, while carbon dioxide is produced in each intermediate step, it is also consumed in each subsequent step, leaving very little at the end of the biodegrade process.