



Degradability vs. Biodegradability

Environmental Information - Update

Health Environment & Regulatory Affairs (HERA)

Much confusion exists with respect to the environmental fate mechanisms of degradability and biodegradability. Many people equate biodegradability with “environmental friendly” labels while neglecting to understand or acknowledge that other naturally occurring mechanisms exist that are also capable of converting polymeric material to common products such as water, carbon dioxide and minerals found in the earth’s crust.

For a more detailed description of how these degradation mechanisms occur, please refer to the Environmental Information UPDATE sheets entitled “Degradation of Silicone Polymers in Nature” Form No. 01-1113-01, “Degradation of Polymers in Nature” Form No. 01-1112-01, and “An Overview of Polydimethylsiloxane (PDMS) Fluids in the Environment” Form No. 01-1034-01. These documents are available through your Customer Service Representative.

Polydimethylsiloxane (PDMS) fluid is a polymeric material that is amenable to a series of degradation reactions that have been identified through rigorous investigations. These reactions occur naturally when the silicone fluid comes into contact with soils. The rate of these reactions will vary depending on soil type and moisture content and can be as rapid as several days under optimum conditions. As the silicone fluid depolymerizes, the monomeric products can then be subject to microbial degradation to CO₂ and inorganic silicates which are already present in soils. Also, the monomers will evaporate from the soil and degrade to natural components in the presence of sunlight. Tests have also shown that the degradation of silicone polymer on soil will not impact the growth of common food crops.

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This scientific information has been presented to German environmental authorities and has earned Dow Corning 561[®] Transformer Fluid (a common form of PDMS) the Blue Angel ecolabel for having a favorable impact upon the environment. This assessment is further evidence that the soil degradation process described above is comparable to biodegradation mechanisms and that any claims or statements to the contrary should be viewed with serious suspicion.

