



# PLASTICS TODAY

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## Betting on the biodegradable bead

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Since the 1990s, when cosmetic manufacturers started using plastic microbeads as abrasives in facial and body scrubs, and other personal care products, users of these products have been rinsing plastic microspheres down the drain with careless abandon. A single container of a personal hygiene product can contain 300,000 or more microbeads. Their small size—approximately 0.5 microns—allows them to pass through the filtration systems of typical water treatment plants and flow into the rivers and other freshwater bodies. The consequences have been dramatic.

These microbeads can attract toxic pollutants and can be consumed by fish, birds and other wildlife. Concentrations as high as 1.1 million microbeads per square kilometer have been found in the Great Lakes, the world's largest source of freshwater.



*Image courtesy 5 Gyre Institute.*

biomaterial produced using a non-GMO, non-toxic, plant-associated process. Unlike other biomaterials that require a compost environment to degrade, TerraVerdae's microspheres are intrinsically biodegradable and meet the American Society for Testing and Materials industry standards for biodegradation in a marine environment. TerraVerdae says it can produce microspheres in a range of sizes, in both smooth and coarse finishes, that feature high optical clarity and the mechanical characteristics to meet all requirements for cosmetic formulations.

"With our bioprocess technology, we can design a responsible solution for cosmetic and personal care products that is environmentally sustainable and that has the exfoliation performance that consumers seek," said Bardosh.

Recently, the Microbeads Free Waters Act of 2015 was filed in the US Senate and the House of Representative to phase out the manufacturing and sale of microbeads found in household products. If passed, the legislation would amend the federal Food, Drug and Cosmetic Act to prohibit, starting January 1, 2018, the distribution of a cosmetic that contains plastic microbeads. Likewise, this past March, the Canadian House of Commons unanimously passed a motion that microbeads should be immediately added to the list of substances managed by the government under the Canadian Environmental Protection Act, 1999.

A number of major companies, such as Johnson & Johnson, Procter & Gamble, Unilever, L'Oreal, and Colgate-Palmolive, have

Now, TerraVerdae BioWorks (Edmonton, Alberta, Canada), an industrial biotechnology company developing advanced bioplastics and environmentally sustainable biomaterials has announced that it is releasing a line of biodegradable, natural microspheres for use in personal care and cosmetic products, as a direct replacement for synthetic, non-degradable plastic microbeads that are currently the subject of restrictive legislation throughout the world.

"Our biodegradable, environmentally safe microspheres have all the performance characteristics that cosmetic manufacturers demand of current polyethylene plastic products," said William Bardosh, CEO and founder of TerraVerdae BioWorks. "But they rapidly and safely break down in the marine environment, leaving behind no harmful solids."

The company's new microspheres are a PHA-based