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Home & Personal Care Ingredients & Formulations

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Interview with *Isabel Almiro do Vale*  
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### ***What are silicones?***

Silicone technologies are a broad family of polymers that take numerous forms, from low viscosity fluids to viscous gums, cross-linked elastomers, and hard resins. They can be leveraged to deliver a nearly unlimited range of problem-solving benefits depending on the consumer's needs.

The starting element for all silicone materials is silicon (Si). It is found in quartz, sand, and even in certain plant husks and is the second most abundant element in the earth's crust after oxygen. A broad range of silicone materials have been used in beauty and personal care products for close to seventy years and are considered the ingredient of choice for a wide range of formulations. They can be used as-is or blended to deliver beauty care ingredients from low viscosity volatile fluids to viscous or solid materials, providing a wide range of materials with multifunctional benefits.

### ***What benefits are your silicones providing for hair products?***

Silicones are a very broad chemical class of materials that provide many different benefits in hair care applications.

Because of their low surface energy, silicones easily spread over the surface of the hair, providing conditioning benefits and an overall healthy look and feel to hair. Because of their hydrophobic properties, Dow silicones can be used as either a pre-treatment or post-treatment to maintain or restore hair to a healthy look and feel despite daily exposure to urban pollution and UV damage.

To prevent hair breakage, amino silicones are ideal as they form a shield to safeguard hair from heat, chemical damage such as bleaching or daily grooming. They are also ideal candidates to avoid color loss for dyed hair. Amino silicones also erase the signs of damage by being excellent anti-frizz products and restoring smoothness, shine, and alignment of damaged hair.

Gum blends are the main class of ingredients used in water-free hair oil formulations, providing benefits like smoothness, shine, frizz control, and heat protection.

### ***How do silicones meet the needs of all consumers?***

Silicones provide benefits for consumers with diverse needs as they are extremely multifunctional. With a unique set of chemical and physical properties, they not only condition hair, but enhance shine, facilitate grooming, provide color protection, help guard against damage from heat during styling, restore damaged hair, give a perception of moisturization, aid curl retention, control frizz and provide desired hair volume.

### ***Can you tell us about the sustainable nature of silicones in hair care products?***

Silicone polymers used in personal care products are non-GMO, chemically inert, and non-reactive biocompatible ingredients that are stable substances under usual environmental conditions. Non-functional silicones are colorless and odorless. None of their components are derived from animals, meaning silicones are vegan-friendly and cruelty-free by default.

In the environment, silicones are expected to be ultimately converted to silica, silicic acid, and carbon dioxide, primarily through non-biological degradation processes such as hydrolysis or photolysis, and through biodegradation by biological organisms.

### ***How is Dow debunking the myths and controversy around silicones in cosmetic products?***

Several myths have developed concerning personal care products containing silicones. However, silicones have a long-standing history of safe use in personal care and consumer product applications because silicones fuel our imaginations and make new products and benefits possible.

For example, some believe that silicones build up on the hair. However, their unique spreading and low intermolecular forces lead to the formation of a single layer, hence silicones do not buildup. Additionally, silicone can be easily removed from hair by a clarifying shampoo.

Others believe silicones can negatively affect the coloration process. On the contrary, studies have shown silicones provide a more vibrant color to the hair when added to the colorant.

Some consider silicones as occlusive materials. Silicones fascinating physico-chemistry provides hydrophobic, hence waterproof, properties when water is in its liquid form. However, the conformation and flexibility of O-Si-O bounds enables water in its vapor form as well as oxygen to pass through a silicone film. This is one of the reasons why silicones are also used in scar treatments, limiting bacterial growth. Thanks to this non-occlusive property, silicone film formers are an ingredient of choice for long-lasting foundations as they do not interact with the breathability function of the skin.

***How are silicones used in hair care products? What are Dow's product offerings for silicones in hair care formulation?***

Dow is creating differentiating specialty silicone technologies that bring beauty to life in a way that has a lasting effect on formulations and on the lives of consumers everywhere.

Examples of Dow's best-performing silicone technologies include **HydroxySHIELD™ Polymer** which helps reduce breakage and ease hair styling by restoring the hair's hydrophobic state. This innovative hydroxyamino functionalized silicone delivers superior conditioning of the damaged hair surface and can be used in shampoos, leave-in products, rinse-of conditioners, or colorants.

**DOWSIL™ PMX-1508 Fluid** is a gum blend in a bioderived, inherently primary biodegradable carrier that can be used in hair care, skin care, sun care, and color cosmetic applications. This unique silicone technology provides multifunctional benefits such as improved dry and wet combing, enhancing hair shine, smoothness, and more.

Another exciting ingredient is **DOWSIL™ 3903 Liquid Satin Blend** which helps to reduce the number of environmental pollution species adhering to the hair.

And silicone technologies are not only leveraged in hair care products, but they also bring an array of benefits to skin care products: A standout silicone technology is **DOWSIL™ 1686 Resin**, which offers shine and radiance, contributes to color value, enables good coverage and moderate wear in personal care applications. This non-GMO silicone resin can be used in a variety of ways in color cosmetics, skin care, and hair care.

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