



 *Biesterfeld*

Headlice Spotlight



Effective head lice treatment with silicone technology

Head lice are a global problem and regularly present practical challenges for those affected and their families. In addition to reliable effectiveness, consumers today expect products that are easy to use, well-tolerated, and leave a pleasant hair feeling. As a result, modern formulation concepts that combine effectiveness and performance are increasingly coming into focus.

While earlier approaches often relied on insecticidal active ingredients, products based on a physical mode of action are gaining increasing importance today. Their advantage lies in an application-oriented, non-neurotoxic approach that focuses on mechanically impairing the lice. Especially in sensitive areas of application such as scalp care, this is a compelling starting point for innovative product development.

Silicones offer a particularly interesting performance profile for such concepts. Thanks to their good spreading and wetting properties, they can be evenly distributed over the hair and scalp, thereby creating the basis for an effective, physically oriented treatment. Depending on the type of silicone used, occlusion, spreadability, and sensory properties can be specifically influenced.

Furthermore, silicones make an important contribution to the quality of the formulation. They can make hair smoother, improve combability, and positively influence wash-out behavior. This results in modern head lice products that are not only functionally effective but also meet expectations for comfort and care.

Biesterfeld is one of the leading international distributors of plastics, chemicals and specialty chemicals. With more than a century of experience, deep industry knowledge and a global network, Biesterfeld has established itself as a reliable partner for the pharmaceutical and dermocosmetic sectors, where the highest standards of quality, safety and technical expertise are essential.

Competence in Solutions

In the field of Medical Skin Protection, customers benefit from Biesterfeld's broad portfolio of **functional ingredients**, **modern formulation technologies** and **comprehensive regulatory know-how**. From high quality ingredients to ready-to-use formulation concepts, Biesterfeld supports development processes holistically — **from initial idea and formulation design to market readiness**.

Strength Through Expertise

Close **collaborations** with world-class **manufacturers**, a **dedicated technical team** and **strong expertise** in topical applications create a clear advantage:

- › Solution-driven guidance
- › Dependable quality
- › Innovative raw materials



Benefits of Silicones in Headlice applications

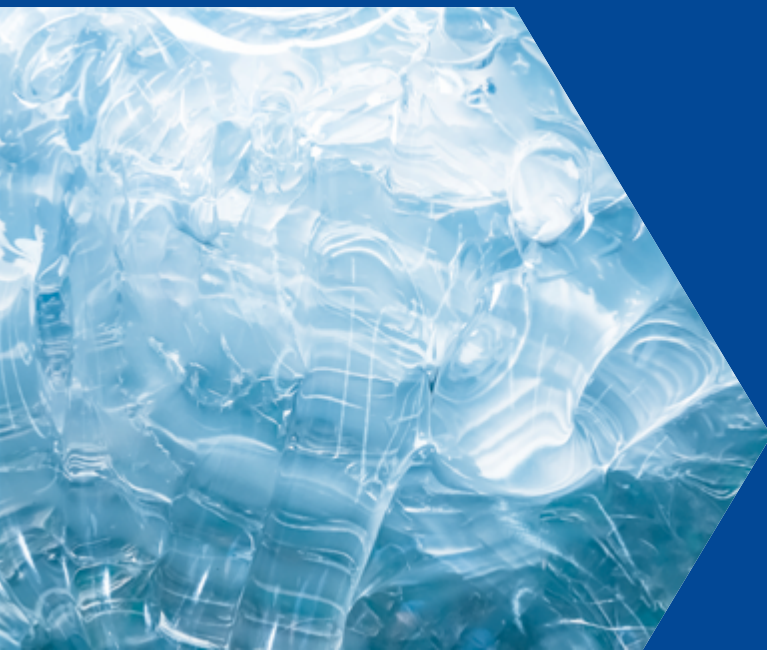
Silicones play a central role in modern, physically acting head lice products. Unlike traditional insecticides, which rely on a neurotoxic mechanism, silicone-based formulations eliminate head lice through **purely physical processes**. Typically, lotions or gels based on PDMS (polydimethylsiloxane) are used for this purpose, which specifically target the external structures of the louse.

Several mechanisms of action have been described in the literature. The most widespread mechanism is that the silicones seal the louse's external breathing openings (spiracles) as well as its tracheal trunks. This impairs the parasite's ability to excrete water. This disruption of water regulation leads to severe osmotic stress, which ultimately causes the death of the louse. This approach is based entirely on mechanical rather than neurotoxic effects and is therefore

considered safe and well-tolerated – for both children and adults.

Another **advantage** of silicone-based head lice products is their **effectiveness against all stages of the parasite's life cycle**. Studies show that silicone formulations can be effective against adult lice as well as nymphs and eggs (nits), which are otherwise often difficult to remove (Burgess & Burgess, 2011). This contributes to greater treatment reliability and reduces the risk of reinfestation.

Overall, silicones offer a **powerful, safe, and well-tolerated** mode of action that circumvents traditional resistance while also providing a pleasant cosmetic profile. Their physical mode of action, combined with high formulation flexibility, makes them **a key component of modern head lice solutions.**



Development of silicone-based head lice products



Successful head lice treatments combine reliable technical efficacy with positive cosmetic performance. Silicones can be easily incorporated into various formulations, such as lotions, gels, or shampoos. Shampoo formulations, in particular, offer the advantage of effectively combining treatment and cleansing in a user-friendly product concept.

Product formats available on the market:

- › Shampoo
- › Lotion
- › Spray

Advantages of silicone-based head lice formulations

- › Suitable as a non-neurotoxic approach for modern head lice products
- › Can avoid resistance to traditional insecticides
- › Effective not only against adult lice, but also against nymphs and eggs
- › Strong clinical evidence supporting dimethicone based formulations
- › Easy to apply to hair and scalp
- › Supports a pleasant cosmetic profile



Silicones in Head Lice Applications

Available Formulation

2-Phase Silicone Shampoo

A two-phase shampoo formulation with mild surfactants and selected silicones can serve as a functional base for a head lice shampoo. By combining both phases, it is possible to create a user-friendly foundation suitable for the development of specialized anti-lice products.

Highlighted Ingredients*:

- › Liveo™ TI-1050 Fluid 2cSt
- › Liveo™ TI-1050 Fluid 100cSt
- › Liveo™ TE-9720 Silicone Resin Blend

*all silicones are below ECHA reportable limit of 0,1% cyclics



Contact

For more information feel free to reach to the Healthcare experts at Biesterfeld at

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Quotes

Burgess, I. F., & Burgess, N. A. (2011). Dimeticone 4% liquid gel found to kill all lice and eggs with a single 15 minute application. BMC research notes, 4(1), 15.

Thielecke, M., Nordin, P., Ngomi, N., & Feldmeier, H. (2014). Treatment of Tungiasis with dimeticone: a proof-of-principle study in rural Kenya. PLoS Neglected Tropical Diseases, 8(7), e3058.

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