

TECHNICAL DATA SHEET

Product Name: Synthetic Beeswax

INCI Name: Paraffin, C10-18 Triglycerides, Cera Alba, Stearic Acid

CAS: 8002-74-2, 85665-33-4, 8012-89-3, 57-11-4

Chemical Class: Mixture

Functional Category: Emulsifier, Viscosity Modifier, Humectant

Description: Synthetic beeswax is an artificially produced wax designed to replicate the functional properties of natural beeswax. Synthetic beeswax ensures consistent product quality, eliminating variability issues that can arise from using natural raw materials. It is used in cosmetic products for its emollient and protective properties, as well as its ability to thicken formulations. It provides structure and stability to emulsions and balms, and as an emollient, it creates a protective film on the skin that helps retain moisture. This feature makes products more pleasant for users, improving texture and viscosity, allowing for easier application and a comfortable feel on the skin. One of the key advantages of synthetic beeswax is its consistency in composition, which brings reliability and stability to formulations. This is particularly important in the cosmetic industry where quality consistency directly affects product performance and efficacy. By using synthetic wax, the need for natural beeswax is reduced, contributing to the preservation of bee populations and promoting sustainability.

Chemical-Physical Properties: Synthetic wax consists of a carefully selected combination of fatty acids, esters, and hydrocarbons, including paraffin (40 - 60%), C10-18 triglycerides (25 - 40%), beeswax (15 - 25%), and stearic acid (5 - 15%). Paraffin is a mixture of hydrocarbons, mainly alkanes, with the molecular formula C_nH_{2n+2} (n usually ranges between 20 and 40). It is insoluble in water but easily dissolves in organic solvents. It has a melting point between 46°C and 68°C and acts as an emollient and thickener, creating a protective barrier on the skin that prevents moisture loss and improves product texture. C10-18 triglycerides can be either unsaturated or saturated. They are stable at room temperature and have good oxidative stability. As emollients, they provide a smooth and moisturizing texture, improving spreadability. They provide a silky feel on the skin and serve as carriers for active ingredients. Beeswax (Cera Alba) consists of esters of fatty acids and long-chain alcohols, containing about 70-80% esters,

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10-15% free fatty acids, and 1-2% free alcohols. It is insoluble in water but dissolves in organic solvents. Stearic acid, a saturated fatty acid with the molecular formula $C_{18}H_{36}O_2$, has a melting point around $69^{\circ}C$. It is soluble in alcohol but not in water. As a thickener and emulsifier, it helps stabilize formulations, allowing for even distribution of ingredients and improving product texture. The wax appears in the form of white pellets with a melting point range of $62^{\circ}C$ to $72^{\circ}C$, which allows stability across a wide temperature range. The density at $25^{\circ}C$ is approximately 0.95 g/cm^3 , and the viscosity at $100^{\circ}C$ is about 10 mPa s , allowing for easy mixing and processing during cosmetic product manufacturing. It is intended for external use only.

Benefits:

- **Adaptability:** Due to its controlled and consistent composition, manufacturers can precisely adjust product characteristics such as texture, viscosity, and moisturizing properties to meet the specific demands of various cosmetic applications. This flexibility makes synthetic wax ideal for adapting to different formulations and market needs.

- **Ecological and Ethical Acceptability:** Using synthetic wax reduces the need for natural beeswax, thereby contributing to the preservation of bee populations and promoting sustainability. This is particularly important in the context of global challenges with declining bee numbers.

- **Wide Temperature Range Stability:** A melting point of $62^{\circ}C$ to $72^{\circ}C$ provides stability across a wide temperature range, which is useful during production and storage. This stability is crucial for maintaining product quality throughout its lifecycle.

- **Easy Processing:** Low viscosity at high temperatures allows for easy mixing and homogenization during production, which is beneficial for various cosmetic formulations. This facilitates manufacturing processes and increases efficiency.

- **Lower Allergy Risk:** Synthetic beeswax has a lower risk of causing allergic reactions compared to natural beeswax. Natural beeswax may contain pollen, propolis, and other bee products, which are known allergens for some people. These natural contaminants can cause allergic reactions in sensitive individuals.

Drawbacks:

- **Lack of Nutrient Active Ingredients:** Natural beeswax contains natural nutrients, vitamins, and antioxidants that contribute to skin health, while synthetic wax does not contain these components.

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- **Natural Scent and Properties:** Natural beeswax has a characteristic pleasant scent and natural properties that some consumers prefer. Synthetic wax may have different sensory characteristics that may not always meet consumer expectations.

- **Biological Compatibility:** Although synthetic beeswax is designed to mimic natural, some users find that natural wax has better biocompatible properties. Natural wax may be better accepted by the skin for some people.

- **Natural Marketing:** Products with natural beeswax may be more appealing to the market that values natural and organically derived ingredients. Natural products often have better marketing and may be perceived as healthier and safer.

- **Consumer Perception:** Some consumers may be skeptical of synthetic products due to the perception that they are less natural or healthier than natural alternatives.

Usage: In creams and lotions, the wax is added to improve texture and create a barrier that retains moisture. In these products, it is usually used in concentrations of 2% to 5%. In lip balms and lipsticks, wax is crucial for achieving the desired hardness and color stability, and it is used in higher concentrations, from 10% to 15%. When formulating these products, synthetic beeswax is melted together with other lipid components at temperatures between 60°C and 70°C until a homogeneous mixture is obtained. After melting, the wax is mixed with other ingredients, such as oils and emulsifiers, to ensure even distribution of the wax throughout the formulation. This method allows for the creation of stable emulsions and products that provide a pleasant feel on the skin. Optimal wax concentrations depend on the specific needs of the product and the desired characteristics, such as hardness, viscosity, and moisturizing properties. Synthetic wax is used in lip balms to achieve optimal hardness and texture, while in creams and lotions it is used in lower concentrations to improve viscosity and create a protective layer on the skin. This way, manufacturers can precisely control the properties of the final product and adapt it to user needs.

Animal Testing: The substance has not been tested on animals

GMO: Non-GMO