

# Rhamnolipid biosurfactant

## Product Introduction

RRhamnolipid possesses diverse functionalities, including surface tension reduction, solubilization, emulsification, demulsification, defoaming, washing, dispersing, flocculating, penetrating, and moistening capabilities. It exhibits remarkable surface activity, demands minimal dosage, and demonstrates exceptional compatibility with other surfactants. It possesses remarkable chemical and biological properties, exhibiting both hydrophilic and lipophilic characteristics. This unique biosurfactant effectively reduces surface tension in water, making it a versatile wetting agent, emulsifier, and foaming agent. Rhamnolipid is resistant to high temperatures and high salts, has strong foaming ability, is non-toxic, biodegradable, and is an environmentally friendly and sustainable alternative product.

Compared to traditional chemically synthesized surfactants, Rhamnolipid has the following notable characteristics and advantages:

- The extensive and intricate chemical structure of rhamnolipids, enriched with numerous active groups, enables superior adsorption at the oil-water interface. Consequently, it effectively diminishes the interfacial tension at both the water-air and oil-water interfaces, resulting in a more favorable environment for various applications.
- **Heat resistance:** retains surface activity even at 90°C.
- **Salt tolerance:** Rhamnolipids remain stable in 10% salt solution, while chemically synthesized surfactants lose activity in 2-3% salt solution.
- **Biodegradability:** Rhamnolipids are easily degraded in water or soil.
- **Low or non-toxic:** Environmentally friendly.

## Product Information

### (1) Cosmetic-grade Rhamnolipid

**Catalog number:** ACJ1768C

**Appearance:** Light yellow to amber transparent liquid

**Appearance:** 100g, 5Kg, 25Kg



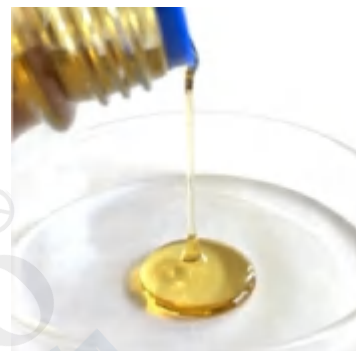
**Application:** Derived through a fermentation process, cosmetic-grade rhamnolipid is environmentally friendly and biodegradable. It finds application in high-end personal care products, offering anti-acne, anti-wrinkle, and moisturizing benefits. This versatile ingredient can be incorporated into skin creams, lotions, facial cleansers, toners, sunscreens, mascara, foundation creams, and scrubs, among others.

## (2) Daily chemical-grade Rhamnolipid

**Catalog number:** ACJ1768D

**Appearance:** Light yellow to amber transparent liquid

**Packaging:** 100g, 5Kg, 25Kg



**Application:** Produced through fermentation using food-grade vegetable oil as the carbon source, daily chemical bioglycolipid is a purified and concentrated rhamnolipid surfactant. Its applications span various fields, including daily chemicals, cleaning, and home care products such as skin care hand soap, laundry detergent, kitchen oil stain removers, and shampoos.

## (3) Pharmaceutical-grade Rhamnolipid

**Catalog number:** ACJ1768G

**Appearance:** White to light yellow powder

**Packaging:** 5g, 25g



**Usage:** This grade of rhamnolipid can be effectively utilized in the treatment of skin burns and certain dermatological conditions. Additionally, it serves as a fundamental medicinal agent for promoting wound healing, modulating immune function, enhancing drug absorption, and exerting antibacterial and anti-inflammatory effects.

## (4) Petroleum- and agricultural-grade Rhamnolipid(Clear liquid)

**Catalog number:** ACJ1768E

**Appearance:** Reddish brown to dark brown liquid

**Packaging:** 1Kg, 5Kg, 1T

**Usage:** Rhamnolipid finds diverse applications in the petroleum, environmental, and agrochemical industries, boasting natural origin, safe usage, environmental friendliness, and no residual effects. In the petroleum sector, it can be employed for tertiary oil recovery, sludge treatment, and oilfield blockage relief. In the environmental realm, it is suitable for soil remediation and wastewater treatment. Furthermore, as a novel biological additive, it is utilized in fertilizers and functional agricultural products, encompassing applications across the agricultural spectrum, including seed cultivation, pesticide and fertilizer additives, soil amelioration, fertilizer efficiency enhancement, plant protection, fishpond water purification, and feed additives.



### **(5) Petroleum- and agricultural-grade Rhamnolipid(Suspension liquids)**

**Catalog number:** ACJ1768F

**Appearance:** Brown suspension liquid

**Packaging:** 1Kg, 5Kg, 1T

**Usage:** Rhamnolipid finds diverse applications in the petroleum, environmental, and agrochemical industries, boasting natural origin, safe usage, environmental friendliness, and no residual effects. In the petroleum sector, it can be employed for tertiary oil recovery, sludge treatment, and oilfield blockage relief. In the environmental realm, it is suitable for soil remediation and wastewater treatment. Furthermore, as a novel biological additive, it is utilized in fertilizers and functional agricultural products, encompassing applications across the agricultural spectrum, including seed cultivation, pesticide and fertilizer additives, soil amelioration, fertilizer efficiency enhancement, plant protection, fishpond water purification, and feed additives.



## Applications

**1. Application in cosmetics:** Rhamnolipid is a surfactant widely used in cosmetics with excellent surface activity, emulsifying activity, skin compatibility and low irritation. It can be used to improve the texture and efficacy of products such as facial cleansers, lotions, toners, sunscreens, mascaras, foundations and scrubs, as well as to make cosmetic microemulsion carriers.

Rhamnolipids, as a surfactant and emulsifier of natural origin with good dermal compatibility and low irritation, can replace these traditional chemical components. It can also help retain moisture, lubricate, generate foam and act as a cleansing agent through its dispersing and wetting properties. Rhamnolipids also have good permeability and non-toxic degradable properties, making them an ideal detergent additive.

**2. Application in daily chemical products:** As a natural surfactant and emulsifier, rhamnolipid has a wide range of applications in daily chemical products. Rhamnolipids have good detergent effect, foaming performance and biodegradability, which makes it an ideal substitute or partial substitute for environmentally friendly and low-pollution detergents. In addition to its use in detergents, rhamnolipid is also used in a wide range of other household products, including anti-dandruff products, skin creams, hair dyes, conditioners, toothpastes, shampoos, soaps, acne pads, deodorants, nail polishes, lipsticks, antiperspirants, baby products, shaving creams, moisturizers, eye shadows, wet wipes, and perfumes. As a natural alternative, rhamnolipids not only have good surface activity and emulsification properties, but are also safer and more harmless. Therefore, the application of rhamnolipids is promising and is expected to realize the goal of greening and low pollution in the daily chemical industry.

**3. Applications in the Petroleum Industry:** Rhamnolipids find numerous applications in the petroleum industry, enhancing oil recovery, mitigating pipeline resistance, and reducing crude oil viscosity. They optimize oil displacement systems, clean tank bottom sludge, prevent wax formation, and improve lubricant performance. Their natural, bio-based surfactant properties position them as an environmentally friendly and sustainable choice, significantly impacting the efficiency and environmental footprint of the petroleum industry. From enhanced oil recovery to drag and viscosity reduction in crude oil pipelines, rhamnolipids are used as anti-wax additives, tank bottom sludge cleaners, and viscosity index improvers.

**4. Applications in Food:** Rhamnolipid is a component with high potential in the food industry. It is widely used as a leavening agent and flavoring agent in baked goods, sponge cakes, and noodles, improving and enhancing the quality and safety of the products. Safety Assessment: According to documents from the United States Environmental Protection Agency (EPA), Rhamnolipid, as a biobased surfactant, is generally non-toxic but may have corrosive effects on the eyes and skin irritation. However, the EPA emphasizes that the ecological risks of Rhamnolipid are low, and its application in the food industry poses no adverse effects on food safety, making it a safe choice.

**5. Applications in Agriculture:** Rhamnolipid exhibits extensive application prospects in agricultural production, playing a crucial role in promoting crop growth, improving fertilizer and pesticide utilization, controlling plant diseases, and soil improvement. Compared to chemical surfactants, it exhibits better wetting and surface activity, with significant inhibitory effects on fungi and waterborne pathogenic bacteria. Moreover, Rhamnolipid-modified biochar can improve saline-alkali soil, enhancing plant adaptability and growth performance.

**6. Applications in Ecology and Environment:** Rhamnolipid can be utilized to address environmental issues such as polycyclic aromatic hydrocarbons (released in incidents like the Gulf of Mexico oil spill), difficult-to-biodegrade COD, and heavy metal pollution. It exhibits environmental remediation capabilities, effectively removing oil, metals, or other pollutants from soil, water bodies, coastlines, and the seabed.

**7. Applications in Medicine:** Rhamnolipid is a medication used for treating skin burns, certain skin diseases, and as a base drug for promoting wound healing, regulating immune function, enhancing drug absorption, as well as exhibiting antimicrobial, anti-inflammatory, and anticancer properties.

**8. Industrial Application:** Rhamnolipid is a concentrated product derived from the crude purification and concentration of rhamnolipid fermentation broth. This grade of rhamnolipid finds widespread use in industrial cleaning, particularly for the removal of heavy oil stains and decontamination of large equipment. Additionally, it is utilized in the printing and dyeing industry for dye dispersion and reformulation assistance.

**9. Other applications:** Rhamnolipids can also be used in industrial cleaning, dye dispersion, scientific research, and other fields.



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