

Lipase (granulate) Technical Sheet

High activity cleaning grade lipase for digesting fats & oils



HIGH ACTIVITY



ECONOMICAL



CLEANING



WASHING



BULK OPTION

Lipase (granulate) Technical Datasheet

1. Product Overview

Our lipase is an alkaline granulate lipase for use in biological detergent products. The product acts by hydrolysing insoluble fat & oil soilings such as those resulting from frying fats, salad oil, butter, gravy, soup, human sebum and cosmetics. This enzyme hydrolyses fats by cleaving the ester bonds of triglyceride molecules producing mono and di-glycerides, glycerol and free fatty acids which can then be readily removed from fabrics. This enzyme is particularly effective at first wash removal of fatty stains in laundry applications. The enzyme is derived from a genetically modified strain of *Aspergillus* spp. The activity is expressed in Kilo Lipase Units (KLU), and contains no significant side-activities.

2. Product Characteristics

Parameter	Specification
Enzyme Class	Peptidase (EC 3.4.)
Source	<i>Bacillus subtilis</i>
Appearance	Off white granulates
Granulate	Titanium Dioxide
Activity	12 KPU / g
Units	Where 1 U is the amount of enzyme required to release 1 µg of tyrosine (or equivalent peptides) per minute from casein
Temperature Range	30–70 °C (operational)
Optimal Temperature	45–55 °C
pH Range	8.0–12.0
Optimal pH	10.0–11.0
Typical final dose rate	1-2 % by volume
Shelf Life	24 months (sealed and kept under recommended storage conditions)

3. Enzymatic Properties

3.1 Mechanism of Action:

Detergent-grade lipases catalyse the hydrolysis of triglycerides and other lipid-based stains through a well-defined serine hydrolase mechanism. Their active site typically contains a catalytic triad (Ser–His–Asp/Glu) that activates the serine residue to form a highly reactive nucleophile. During catalysis, the serine attacks the ester bond of the lipid, generating an acyl–enzyme intermediate, which is subsequently cleaved by a water molecule to release fatty acids and glycerol. Many lipases also possess a “lid” domain that opens at the water–lipid interface, enhancing substrate accessibility—an effect especially important in detergent applications where stains are hydrophobic. Detergent-grade

Lipase (granulate) Technical Datasheet

lipases are engineered to remain stable in alkaline conditions, surfactants, and varying wash temperatures, allowing them to efficiently convert insoluble fats, oils, and grease into soluble products that can be emulsified and rinsed away during the cleaning process. Reaction scheme:



3.2 Kinetics:

Detergent-grade lipases typically follow Michaelis–Menten reaction kinetics, in which the enzyme first binds insoluble lipid substrates at the water–lipid interface before catalysing ester-bond hydrolysis. Their kinetics are strongly influenced by interfacial activation, a process in which the lipase's lid domain opens upon contact with hydrophobic surfaces, increasing catalytic turnover and lowering the effective K_m . Because substrates are often emulsified rather than freely soluble, reaction rates depend not only on substrate concentration but also on surface area, emulsification efficiency, and surfactant composition. The catalytic efficiency (k_{cat}/K_m) is optimized for alkaline conditions typical of detergents, where lipases maintain high activity despite the presence of surfactants, builders, and oxidants. Temperature also plays a critical role, with many detergent-grade lipases engineered to deliver rapid hydrolysis at low to moderate wash temperatures, supporting effective removal of fats, oils, and grease in real-world cleaning environments.

3.3 Inhibitors:

- Heavy metals (Hg^{2+} , Cu^{2+})
- Urea, Guanidine hydrochloride, SDS
- High temperatures above 90 deg. C
- High chelator concentrations (EDTA)

4. Key Applications

- Removal of fatty, oily, and greasy stains from fabrics (e.g., sebum, cooking oils, butter, cosmetic oils).
- Enhanced dishwashing performance, breaking down baked-on or emulsified fats.
- Improved cleaning in cold- and low-temperature wash conditions by efficiently hydrolysing lipids.
- Boosting overall detergent efficacy when combined with surfactants and builders.
- Industrial and institutional cleaning, especially for kitchens, food-processing surfaces, and oil-rich residues.
- Support in wastewater and drain maintenance products, helping degrade fat deposits.
- Textile pre-treatment and processing, aiding in removal of natural oils and improving fabric wettability.

5. Handling & Storage

5.1 Storage Conditions:

Lipase (granulate) Technical Datasheet

- Store at 4–25 °C in sealed containers
- Avoid direct sunlight and freezing
- Keep away from acids, oxidizing agents, and heavy metals

5.2 Stability on Storage:

- Activity loss ~1–3% per month at room temperature
- Refrigeration improves stability

5.3 Safety Information:

- Non-toxic and biodegradable
- May cause allergic reactions via inhalation or skin contact
- Use protective clothing, gloves, goggles
- Avoid aerosol formation

Refer to product MSDS for complete safety details.

6. Packaging Options

- 100 g, 1 kg, 10 kg, 25 kg

7. Quality Control Specifications

Test	Specification
Activity assay	≥ labelled activity
Moisture (powder)	≤ 8%
Microbial load	Total plate count ≤ 50,000 CFU / g
Pathogens	<i>Salmonella</i> negative, <i>E. coli</i> negative

9. Shelf Life

Powder: 24 months when stored in original container, sealed, in cool conditions.

10. Disclaimer

This technical data sheet provides general information. Application testing is recommended to determine optimal use conditions.

NOTE: THIS DOCUMENT CANCELS AND SUPERSEEDS ALL OTHER EDITIONS

Lipase (granulate) Technical Datasheet
