APEX BIOTECH

Fungal Alpha-Amylase for Bakery Flour Correction

A technical overview for controlled correction of low or inconsistent flour amylolytic activity in bread, buns, pastries, and industrial dough systems.

APPLICATION	Bakery & Pastry | Bread, buns, pastry dough, flour correction
DOCUMENT TYPE	Commercial technical overview
LEGAL ENTITY	Guangzhou Apex Biotech Co., Ltd.

How to use this document

Use this overview to screen technical fit, plan a controlled bakery trial, and define the COA and market documents required before commercial use.

> Activity units are method-dependent and cannot be converted directly into one universal addition rate. Final use level must be set from the supplied product COA, native flour enzyme activity, formulation, and production trials.

Source discipline

Reference specification ranges below are adapted from a third-party technical sheet supplied with commercial adaptation rights. They are not presented as Apex Biotech batch data. Public research and regulatory sources are identified separately.

Function and technical positioning

Fungal alpha-amylase is an endo-acting enzyme that cleaves internal alpha-1,4 glycosidic bonds in starch. In dough, this increases soluble dextrins and fermentable sugars available during fermentation and early baking. The practical objective is not maximum hydrolysis. It is controlled correction of flour performance within the formula and process window.

Reference specification framework

Technical field	Reference range or requirement	Use in Apex evaluation
Source	Aspergillus oryzae in the supplied reference sheet	Confirm production strain and regulatory dossier for the offered grade.
Activity definition	One unit hydrolyzes 1 g soluble starch in 1 hour at 40 C and pH 5.0 under the stated assay	Do not compare units across suppliers without method equivalence.
Activity range	Reference solids: 50,000 or 100,000 U/g; reference liquid: 20,000 U/mL	Use the batch COA value for trial calculations.
pH	Reference working range 4.0-6.5; optimum 4.5-5.5	Verify dough pH and buffering; formulation ingredients can shift realized activity.
Temperature	Reference working range 35-65 C; optimum 45-55 C	Treat the range as supplier-method information, not universal thermal stability.
Storage	Reference sheet: sealed below 25 C in a cool, dry place for 6 months	Follow the delivered label and stability statement. Protect from heat and sunlight.

Application fit

Bread and buns: support gas production, loaf volume, crust color, and crumb uniformity when flour activity is low. Pastry and laminated dough: evaluate proof response and color without weakening structure. Flour correction: normalize performance across wheat lots by pairing enzyme trials with falling number, damaged starch, protein quality, and process data.

Trial design and risk boundaries

Characterize	Record flour falling number or another validated amylolytic index, damaged starch, protein, dough pH, water absorption, and current fermentation response.
Define controls	Run an untreated control and the current plant standard. Keep flour lot, mixing, proofing, bake profile, and cooling constant.
Create a gradient	Calculate several low-to-high activity treatments from the actual COA. Do not convert a supplier unit into ppm by assumption.
Measure	Track dough handling, proof time, specific volume, crust color, crumb cell distribution, crumb firmness, stickiness, and day-over-day quality.
Confirm	Repeat the selected treatment on multiple batches and production conditions before releasing a commercial specification.

Overuse indicators

Excessive amylolysis can create sticky or gummy crumb, excessive crust color, weakened dough tolerance, poor slicing, or an imbalanced fermentation profile. A shelf-life improvement claim requires a defined storage study. Alpha-amylase does not replace sanitation, cooling, packaging, or mold-control validation.

Interaction check

Evaluate alpha-amylase together with lipase, xylanase, glucose oxidase, emulsifiers, malt, reducing sugars, and the actual flour enzyme background. These systems can change water distribution, gas retention, dough strength, browning, and crumb texture. A combination should be optimized as a system rather than by adding each supplier maximum.

References and technical basis

1. Supplied commercial reference sheet: fungal alpha-amylase, pages 1-2. Used only for reference specification ranges and handling language.

2. Sanz Penella JM et al. Experimental approach to optimize the use of alpha-amylases in breadmaking. Journal of Agricultural and Food Chemistry. 2001. PMID 11409995.

3. U.S. FDA. Enzyme Preparations Used in Food (Partial List). The standardized flour provision notes alpha-amylase from Aspergillus oryzae.

4. EFSA. Food enzymes topic and individual enzyme safety opinions. Authorization and intended-use conditions are preparation-specific.

Food-enzyme authorization, processing-aid treatment, labeling, and permitted use conditions must be rechecked for each destination market and final enzyme preparation. Avoid creating inhalable dust when handling powdered enzyme preparations.