

Product Name & Description

Product Name: Premium Gelatin for Micro-encapsulation (Specialized Wall Polymer Grade)

Description: Advanced food and pharmaceutical-grade gelatin, custom-engineered with a tightly calibrated molecular weight distribution and precise isoelectric point kinetics. Specifically designed to act as a high-performance shell/wall material or protective colloid, this ingredient excels in complex coacervation, spray drying, and emulsion-matrix immobilization processes. It provides exceptional emulsion stabilization, film flexibility, and excellent barrier shielding against oxidation, light cross-reactions, and thermal degradation, making it the ideal choice for micro-encapsulating fat-soluble vitamins, nutritional oils, and sensitive flavor compounds.

Key Specifications & Quality Parameters

Analysis Item	Specification Standard	Test Method Reference
Appearance	Light yellow to off-white refined granular powder	Visual / USP Standard
Odor & Taste	Completely bland, neutral tasteless sensory profile	Sensory Panel (10% sol)
Jelly Strength (Bloom)	240 – 260 Bloom (High cohesive network grade)	6.67% sol, 10°C, Bloom Gelometer
Kinematic Viscosity (6.67%, 60°C)	3.5 – 4.5 mPa·s	Capillary Viscometer
Isoelectric Point (IEP)	• Type A (Acid): 7.0 – 9.0 • Type B (Lime): 4.7 – 5.3 (Optimized for Coacervation)	Isoelectric Focusing / Zeta Potential
Clarity (Transmittance)	≥ 85.0% (at 450 nm) / ≥ 90.0% (at 620 nm)	UV-Vis Spectrophotometer
pH (6.67% Solution at 55°C)	5.0 – 6.5	Potentiometric
Loss on Drying (Moisture)	≤ 13.0%	105°C Oven Drying
Residue on Ignition (Ash)	≤ 1.5% (Ultra-low mineral matrix for coacervation)	Gravimetric (550°C)
Peroxides (as H ₂ O ₂)	≤ 10 ppm	Pharmacopoeia Method
Sulfur Dioxide (SO ₂)	≤ 30 ppm	Distillation / Titration
Heavy Metals (as Pb)	≤ 10 ppm	AAS / ICP-MS
Total Aerobic Plate Count	≤ 500 cfu/g (Strict premium hygiene)	USP <61>
Molds & Yeasts	≤ 50 cfu/g	USP <61>
Salmonella & E. Coli	Absent / 25g & Absent / g	USP <62> / Negative

Functional Features & Technological Process Optimization

- **Excellent Complex Coacervation Yield:** Features highly controlled charge density profiles. When paired with anionic polymers like Gum Arabic or Sodium Carboxymethyl Cellulose (CMC) at specific pH boundaries below its isoelectric point, it initiates highly precise liquid-liquid phase separation, resulting in smooth, uniform, and robust microcapsule shells.
- **Superior Protective Colloidal & Emulsifying Dynamics:** Rapidly lowers interfacial tension at oil-water boundaries, allowing for the stable reduction of active core oil droplets to the micron scale without droplet coalescence.
- **Elite Oxygen & Oxidative Barrier:** The dense, highly cross-linked protein matrix formed during drying serves as a professional shield against gas permeability, significantly retarding the oxidation of long-chain polyunsaturated fatty acids (PUFAs) and highly volatile oils.
- **Thermal Release & Mechanical Resilience:** Microcapsules formulated with this grade maintain physical stability during wet processes, yet deliver clean, thermo-reversible release or pressure-sensitive release upon ingestion or processing shear.

Core Micro-encapsulation Applications

- **Nutritional Lipid Immobilization (Omega-3, Fish Oil, MCT):** Converts sensitive liquid marine, algal, or vegetable oils into completely stable, free-flowing, and odorless dry powders for infant formulas and functional foods.
- **Fat-Soluble Vitamin Encapsulation (Vitamins A, D3, E, K2):** Provides exceptional protection for delicate, light-sensitive micronutrients against thermal stress during tablet compression or premix blending.
- **Volatile Flavor & Essential Oil Preservation:** Locks in delicate bakery, citrus, or mint essential oils, masking core off-notes and ensuring long-lasting aroma burst during food preparation or chewing.
- **Probiotic & Enzyme Shielding:** Serves as a primary protective matrix layer to insulate sensitive biotics from aggressive gastric acids, ensuring targeted intestinal delivery.

Regulatory Compliance & Dietary Systems

- **Global Quality Systems:** Processed within state-of-the-art facilities running under verified cGMP, ISO 9001, ISO 22000, and FSSC 22000 management networks.
- **Pharmacopoeia & Purity Alignment:** Satisfies all chemical purity benchmarks defined by the US Food Chemicals Codex (FCC), JECFA, United States Pharmacopoeia (USP), and European Pharmacopoeia (EP).
- **Global Market Freedom:** Available with fully accredited Halal and Kosher certifications. 100% trace-verified from healthy raw materials, carrying full BSE/TSE-free guarantees.

Packaging, Logistics & Storage Architecture

Packaging: Multi-wall heavy-duty industrial Kraft paper outer bags combined with a heat-sealed airtight Polyethylene (PE) inner moisture barrier. Standard net weight: 25 KG per bag.

Storage Requirements: Maintain in unopened original bags within a clean, cool ($< 25^{\circ}\text{C}$), and exceptionally dry warehouse space (relative humidity strictly ****between 45% and 60%****). Keep heavily insulated from volatile aromatic vectors, external moisture exposure, and direct thermal energy.

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Disclaimer: The processing metrics reported above represent standard quality output. Because microcapsule wall deposition is highly sensitive to salt concentration and system pH, formulators are strongly advised to run baseline zeta-potential curves during coacervation pilot trials.