LiposoMore

LiposoMore® – Advanced Liposomal Ingredients
Delivering Premium Nutrition Through Science & Innovation

A Liposomal Brand Exclusively Owned by
Joyful Nutritional Supply Co.,ltd.

Technical Data Sheet: LiposoMore® Liposomal L-Isoleucine Powder

Product Identification and Brand Heritage

LiposoMore® Liposomal L-Isoleucine Powder is an advanced, premium-grade microencapsulated amino acid specifically engineered to overcome the physiological absorption barriers, low water solubility, and bitter taste profiles associated with free-form branched-chain amino acids.[1] The active molecule, L-Isoleucine ($C_6H_{13}NO_2$, CAS No:73-32-5 , Molecular Weight: $131.17\ \mathrm{g/mol}$), is an essential branched-chain amino acid (BCAA) that plays a critical role in human protein synthesis, tissue repair, and energy metabolism.[3] Under the LiposoMore® brand, the hydrophobic crystalline structure of L-Isoleucine is coated with a high-purity phospholipid bilayer, transforming it into a highly water-dispersible, thermodynamically stable colloidal powder.[1]

This premium ingredient is manufactured by Joyful Nutritional Supply Co., Ltd., a globally recognized pioneer in nutritional microencapsulation and advanced delivery technologies.[1] The company's state-of-the-art production facility in Shenzhen, China, spans a massive $100,000\ \mathrm{m}^2$ footprint equipped with four highly automated, intelligent production lines.[1] To guarantee the highest degree of food safety and quality compliance, the entire manufacturing facility operates under a quality management system certified to the FSSC 22000 standard.[7] All raw materials and finished batches undergo rigorous physical, chemical, and microbiological testing in an in-house laboratory certified by CNAS.[7] Through continuous innovation in microencapsulation, emulsification, and lipid-bilayer embedding, LiposoMore® establishes a benchmark of quality and clinical efficacy for premium sports nutrition and dietary supplement brands globally.[7]

Scientific Benefits of L-Isoleucine

As an essential branched-chain amino acid, L-Isoleucine cannot be synthesized endogenously

by the human body and must be acquired through diet or supplementation.[9] It serves as an indispensable physiological building block, constituting approximately 35% of the essential amino acids present in skeletal muscle tissue.[5]

L-Isoleucine is highly regarded for its dual anabolic and metabolic functions:

Stimulation of Muscle Protein Synthesis and Recovery

Working in synergy with L-Leucine and L-Valine, L-Isoleucine initiates muscle protein synthesis by triggering the mechanistic target of rapamycin (mTOR) signaling pathway.[11] This pathway upregulates translation initiation factors that drive muscle hypertrophy, skeletal tissue repair, and lean body mass development.[9] During intense physical exertion, skeletal muscle fibers undergo structural micro-tears.[12] Supplementation with L-Isoleucine accelerates the repair of these damaged fibers, substantially reducing the severity and duration of Delayed Onset Muscle Soreness (DOMS) and minimizing muscle catabolism.[10]

Regulation of Glucose Homeostasis and Energy Production

Unlike other amino acids, L-Isoleucine is uniquely capable of enhancing insulin-independent glucose uptake into skeletal muscle cells.[11] It stimulates the translocation of glucose transporter 4 (GLUT4) to the cell membrane, promoting the utilization of glucose for energy production while inhibiting hepatic gluconeogenesis.[11] During prolonged workouts, L-Isoleucine can be converted into glucose to preserve muscle glycogen stores, preventing the acute physical fatigue and cognitive decline associated with energy depletion.[10] This unique metabolic signaling profile makes L-Isoleucine a vital ingredient for athletic endurance, weight management, and metabolic support formulations.[13]

Advantages of Liposomal Encapsulation Technology

Despite its therapeutic value, pure L-Isoleucine poses significant formulation and absorption challenges.[3] It is highly hydrophobic, virtually insolubilizable in standard aqueous solutions without synthetic surfactants, and possesses a bitter, unpalatable taste.[3] Orally ingested free amino acids also suffer from poor absorption profiles due to the saturation of active transporter channels in the gut, resulting in rapid hepatic first-pass clearance and a short plasma half-life.[6]

The LiposoMore® advanced encapsulation system resolves these bottlenecks through a biomimetic delivery mechanism [1]:

Superior Bioavailability via Biomimetic Transport

By embedding L-Isoleucine within a sphere-shaped, double-layered phospholipid vesicle, the active ingredient is effectively shielded from environmental, enzymatic, and chemical stresses.[6]

The outer shell of the liposome, composed of natural phosphatidylcholine, is biomimetic, meaning it mirrors the exact structure of human enterocyte membranes.[6] This biological mimicry allows the liposome to function as a "Trojan Horse," bypassing the saturable active transporter channels that normally restrict standard amino acid absorption.[6] Upon ingestion, the liposomes interact with the enterocyte cell membrane of the intestinal mucosa, delivering the active payload directly into the cells via endocytosis or membrane fusion.[6] A substantial portion of the liposomes also transits directly into the lymphatic system, bypassing hepatic first-pass metabolism entirely and entering systemic circulation intact.[6]

Gastric Protection and Superior Tolerability

High-dose amino acid powders frequently cause gastrointestinal side effects, such as localized osmotic irritation, nausea, stomach cramps, and diarrhea, due to direct contact with the sensitive gastric mucosa.[6] The LiposoMore® technology fully encapsulates the amino acid payload within a protective lipid barrier, eliminating direct contact with the stomach lining and ensuring complete gastrointestinal gentleness, even for sensitive or reactive individuals.[6]

Controlled Release and Taste Masking

The liposomal structure provides a controlled, sustained release of the amino acid into the bloodstream.[2] This avoids the sharp plasma concentration spikes and subsequent rapid excretion associated with standard amino acid ingestion, creating a prolonged anabolic "depot effect" in muscle tissues.[2] Furthermore, the phospholipid shell naturally masks the bitter taste of the amino acid, allowing for cleaner, better-tasting final product formulations without the need for excessive artificial sweeteners.[1]

Technical Specifications and Physicochemical Profile

The physical, chemical, and microbiological specifications of LiposoMore® Liposomal L-Isoleucine Powder are established in accordance with rigorous in-house standards and tested using validated USP methodology.[1]

Parameter	Specification	Test Method
Physical & Chemical Analysis		
Appearance	White to almost white particles and powders	USP Visual Examination [1]

Odor	Odorless	USP Organoleptic Test [1]
Solubility	Dispersible in water	USP Solubility [1]
Active Purity (L-Isoleucine Assay)	＞68%	USP Chromatography (HPLC) [1]
Loss on Drying	＜2.0%	USP Loss on Drying [1]
Bulk Density	Report value (Typical range: 0.35-0.4g/ml)	USP Bulk Density [1]
Particle Size Distribution	90% pass 80 mesh	USP Particle Size Distribution [1]
Heavy Metals & Elemental Impurities		
Total Heavy Metals	＜10.0 PPM	USP Heavy Metals (ICP-MS) [1]
Lead (Pb)	＜3.0 PPM	USP Elemental Impurities [1]
Mercury (Hg)	＜0.1 PPM	USP Elemental Impurities [1]
Cadmium (Cd)	＜1.0 PPM	USP Elemental Impurities [1]
Arsenic (As)	＜1.0 PPM	USP Elemental Impurities [1]
Microbiological Limits		
Total Plate Count	≤1000cfu/g	USP Microbiological Examination [1]
Molds & Yeasts	≤100cfu/g	USP Microbiological Examination [1]
Escherichia coli	Negative / g	USP Microbiological Examination [1]

Salmonella spp.	Negative / 25 g	USP Microbiological Examination [1]
Staphylococcus aureus	Negative / 25 g	USP Microbiological Examination [1]

Composition and Ingredient Declaration

LiposoMore® Liposomal L-Isoleucine Powder is formulated utilizing food-grade, high-purity ingredients to ensure maximum encapsulation efficiency, stability, and nutritional value.[1] The synergistic carrier system is optimized for powder dispersibility and flowability.[1]

Component	Function	Target Weight %	Source / Origin
L-Isoleucine	Active Nutritional Substrate	68.	Vegetarian Fermentation [3]
Phospholipids	Liposome Bilayer Membrane	15.0%	Non-GMO Sunflower Lecithin [20]
Acacia Gum / Dextrin	Protective Carrier & Flow Agent	10.0%	Natural Plant Extract [20]
Residual Moisture	Inherent Hydration State	＜2.0%	Process Inherent [1]

Comparative Analysis Profile

To assist brand formulators and technical specialists, the following table illustrates the performance advantages of LiposoMore® Liposomal L-Isoleucine Powder compared to traditional, unencapsulated L-Isoleucine raw materials [1]:

Attribute	LiposoMore® Liposomal L-Isoleucine	Traditional L-Isoleucine Powder	Formulator Benefit
Water Solubility	Fully dispersible in aqueous media [1]	Hydrophobic, floats on surface [3]	Ideal for RTD beverages and clear drink mixes [6]
Bioavailability	High; absorbed via direct cellular fusion and lymphatic transit [6]	Low; reliant on saturated active intestinal transporters [6]	Lower required dosages; enhanced clinical efficacy [6]
Palatability	Neutralized; bitter notes masked by lipid bilayer [1]	Highly bitter and difficult to flavor [4]	Reduces reliance on artificial flavors and sweeteners [6]
Gastrointestinal Tolerability	Gentle; no direct contact with gastric mucosa [6]	May cause cramps, nausea, or diarrhea at high doses [14]	Broadens market appeal to sensitive consumer segments [6]
Release Kinetics	Sustained release; steady plasma levels [2]	Rapid spike and quick urinary excretion [16]	Continuous amino acid delivery to target muscles [2]

Quality, Regulatory, and Compliance Declarations

To satisfy the demanding regulatory requirements of global nutritional supplement markets, Joyful Nutritional Supply Co., Ltd. provides the following quality assurances for LiposoMore® Liposomal L-Isoleucine Powder [1]:

- **Genetically Modified Organisms (GMO) Status**: The product is strictly Non-GMO.[24] The active L-Isoleucine is derived from vegetarian fermentation, and the coating is composed of non-GMO sunflower phospholipids.[1] No genetically modified materials or processing aids are introduced during any stage of manufacture.[24]
- **Allergen-Free Status**: The manufacturing process ensures complete isolation from major allergens.[26] The product does not contain, nor does it come into contact with, soy, wheat, gluten, milk, eggs, peanuts, tree nuts, fish, shellfish, celery, mustard, or sesame.[26]
- **Gluten-Free Compliance**: The product is certified gluten-free, with gluten levels guaranteed to be below the detection limit of $20\ \text{ppm}$, making it safe for individuals

with celiac disease or gluten hypersensitivities.[26]

- **BSE/TSE Status**: LiposoMore® Liposomal L-Isoleucine is formulated entirely from plant-derived and vegan-friendly materials.[1] It contains no animal products or materials of animal origin, and does not pose any risk of Bovine Spongiform Encephalopathy (BSE) or Transmissible Spongiform Encephalopathy (TSE).[27]
- **Irradiation and Sulfonization**: No ionizing radiation, ethylene oxide treatment, or sulfonization is used in the treatment of the raw materials or final powder, preserving the physical and biological integrity of the liposomes.[25]

Storage, Stability, and Packaging Guidelines

The structural stability of liposomal powders is highly dependent on environmental control, as exposure to excess moisture, heat, or oxygen can induce the hydrolysis of phospholipid ester bonds and compromise the lipid bilayer.[30]

Standard Packaging Configuration

The material is packaged in food-grade, high-density polyethylene (HDPE) double bags, heat-sealed and enclosed within rigid $25\ \mathrm{kg}$ fiber drums to provide superior barrier protection against mechanical stress and ambient humidity.[32]

Storage Conditions

Store the product in its original, unopened packaging in a cool, dark, and dry environment, away from direct sunlight, heat sources, and moisture.[1] The recommended storage temperature is below $25^{\circ}\mathrm{C}$ (ideally kept refrigerated at $2^{\circ}\mathrm{C}$ to $8^{\circ}\mathrm{C}$ for long-term physical stability and to prevent phospholipid degradation).[22] Avoid freezing, as extreme low temperatures can cause structural micro-fractures in the lipid bilayer when hydrated.[22]

Shelf Life

The product possesses a guaranteed shelf life of 24 months (2 years) from the date of manufacture when stored in original, unopened packaging under recommended conditions.[1] Once opened, the container must be tightly resealed after use to limit moisture absorption, and the contents should be consumed within 90 days to ensure optimal functional potency.[22]

Applications and Formulation Guidelines

LiposoMore® Liposomal L-Isoleucine Powder is specifically optimized for advanced sports nutrition and clinical dietary supplements, including recovery drink mixes, single amino acid capsules, multi-ingredient BCAA powders, and functional food products.[9]

- **Synergistic Blending**: To achieve the ultimate muscle-building and recovery efficacy, the powder can be blended with Liposomal L-Leucine and Liposomal L-Valine to maintain the highly sought-after $2:1:1$ or $4:1:1$ BCAA ratio, ensuring simultaneous, high-bioavailability stimulation of the mTOR pathway.[11]
- **Handling and Reconstitution**: The powder exhibits excellent flowability and compressibility, making it highly compatible with high-speed capsule filling and tablet compression equipment.[20] When formulating liquid preparations or dry drink mixes, the liposomes disperse rapidly in water at room temperature with gentle agitation.[1]

  High-shear blending, ultra-sonication, or temperatures exceeding $40^{\circ}\mathrm{C}$ must be avoided during the blending or manufacturing process, as excessive mechanical and thermal energy can disrupt the delicate phospholipid bilayer vesicles.[22]

Technical Support and Contact Information

For technical inquiries, safety data sheets (SDS), sample requests, or custom formulation development, the global technical support team can be contacted directly.[1]

- **Joyful Nutritional Supply Co., Ltd.** [1]
- **Production & Administration Address**: No.2045 Songbai Road, Baoan District, Shenzhen, China [1]
- **Official Web Portal**: www.liposomore.com [1]
- **Inquiry Email**: Sales@liposomore.com [1]