



LiposoMore

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

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

LiposoMore™ Liposomal Melatonin Powder: Technical Research & TDS

1. Executive Summary and Strategic Positioning

This report outlines the construction of a **Technical Data Sheet (TDS)** for **Liposomal Melatonin Powder**, a core product under the **LiposoMore™** brand by **Joyful Nutritional Supply Co., Ltd.** This document is designed to meet international pharmaceutical and high-end dietary supplement industry standards.

In the global sleep aid and anti-aging market, standard melatonin ingredients face two primary challenges: low oral bioavailability (typically around 15%) due to extensive first-pass metabolism in the liver, and a short half-life that limits its ability to sustain sleep throughout the night.¹ **LiposoMore™** addresses these issues using advanced phospholipid bilayer microencapsulation, protecting the active ingredient and enhancing cellular uptake.

This report is not merely a formatting exercise but a scientific validation of a high-performance functional ingredient. It analyzes the raw material source, manufacturing process (involving high-pressure homogenization and spray drying), physicochemical properties, and safety parameters. Based on the analysis of typical Certificates of Analysis (COA) for this product grade, the material demonstrates superior specifications, particularly in heavy metal control (Pb < 3ppm) and microbiological safety.

The final English TDS included in Section 6 serves as a key technical marketing tool to communicate "High Potency, Stability, and Compliance" to CMOs and brand owners in the US and European markets.

2. Manufacturer Background: Joyful Nutritional Supply Co., Ltd.

2.1 Corporate Overview

Joyful Nutritional Supply Co., Ltd. is a leading manufacturer of mineral and functional ingredients based in Shenzhen, China. Unlike traditional traders, Joyful is a solutions provider with robust manufacturing capabilities, focusing on resolving bioavailability issues in nutrients.

- **Manufacturing Capability:** The company operates a 10,000-square-meter facility with four intelligent production lines. This scale ensures **Batch-to-Batch Consistency**, a critical metric for pharmaceutical and food-grade ingredients. Their technologies include microencapsulation, embedding, emulsification, and micro-crystallization.
- **Quality Systems:** Trust in the supplement supply chain is built on transparency. Joyful Nutritional Supply is **ISO 22000** (Food Safety Management) and **FSSC 22000** verified. Crucially, their facility houses a **CNAS-certified laboratory**, granting their COA data international recognition for tests such as ICP-MS heavy metal analysis and USP-standard microbiology.

2.2 The LiposoMore™ Technology Platform

LiposoMore™ is Joyful's proprietary trademark for liposomal technology, signaling "Liposome + More Benefits."

- **Mechanism:** The technology uses phospholipids (from non-GMO sunflower or soy) to form bilayer structures mimicking human cell membranes. This "Trojan Horse" mechanism protects melatonin from gastric acid and facilitates absorption via the lymphatic system, potentially bypassing first-pass liver metabolism.
- **Powder Stability:** While many liposomes are liquid (prone to oxidation and hydrolysis), LiposoMore™ utilizes precision drying (e.g., spray drying) with carriers like maltodextrin to create a stable, free-flowing powder. Data indicates excellent moisture control (Loss on Drying ~3.8%), ensuring a 24-month shelf life without compromising the liposomal structure upon rehydration.

3. Melatonin Science: Mechanisms and Delivery

3.1 Physiological Function

Melatonin (N-acetyl-5-methoxytryptamine) is the primary hormone regulating circadian rhythms.

- **Sleep Regulation:** It signals "darkness" to the body, activating MT1 and MT2 receptors to induce sleepiness and align the biological clock. Clinical studies confirm its efficacy in reducing sleep latency and alleviating jet lag.
- **Antioxidant Power:** Beyond sleep, melatonin is a potent endogenous free-radical scavenger, neutralizing hydroxyl and peroxide radicals, which supports neuroprotection and immune health.

3.2 Limitations of Standard Melatonin

Standard crystalline melatonin suffers from significant pharmacokinetic drawbacks:

1. **Low Bioavailability:** Absolute oral bioavailability is approximately **15%**, as the majority is degraded by CYP1A2 enzymes in the liver immediately after ingestion.
2. **Short Half-Life:** With a plasma half-life of 20–50 minutes, standard melatonin helps users fall asleep but often fails to keep them asleep (sleep maintenance).

3.3 The Liposomal Advantage

The TDS "Product Advantages" section highlights how LiposoMore™ solves these problems:

- **Lymphatic Bypass:** Liposomes can be taken up by M-cells in the Peyer's patches of the intestine, entering the lymphatic system and entering circulation without passing through the liver first.
- **Sustained Release:** The multi-lamellar structure degrades slowly, extending the Mean Residence Time (MRT) in the blood to mimic the body's natural nightly secretion curve.

4. Specification Analysis (Based on Typical Analysis)

This section interprets the technical data generally observed for this product grade to establish TDS specifications.

4.1 Identification & Physical Properties

- **Appearance:** White to off-white powder. This indicates high purity and proper drying; yellowing would indicate phospholipid oxidation.
- **Odor:** Characteristic (slight lipid scent).

4.2 Physicochemical Metrics

- **Assay (Melatonin):**
 - **Spec:** ≥ 50.0%
 - **Analysis:** ~52%
 - **Insight:** This **50% active load** is industry-leading. Many liposomal powders contain

only 10-20% active ingredient due to the high amount of carrier required. High potency allows for smaller capsule sizes and efficient formulation.

- **Loss on Drying (LOD):**
 - **Spec:** < 10.0%
 - **Analysis:** ~3.8%
 - **Insight:** Low moisture prevents phospholipid hydrolysis, ensuring stability.⁴
- **Heavy Metals:**
 - **Lead (Pb):** < 3.0 ppm
 - **Mercury (Hg):** < 0.1 ppm
 - **Insight:** Complies with USP and California Prop 65 limits, essential for US market entry.⁴

4.3 Microbiological Control

- **Total Plate Count:** < 1,000 CFU/g.
- **Pathogens:** Negative for E. Coli, Salmonella, S. Aureus. Confirms food safety compliance.

5. TDS Structure & Content Strategy

Based on competitor analysis (e.g., MedChemExpress, Active Concepts) , the TDS is structured as follows:

5.1 Regulatory Statements

To build trust, the TDS must explicitly state:

- **Non-GMO:** Phospholipid sources are verified non-genetically modified.
- **Gluten-Free:** Complies with FDA <20ppm standards.
- **Allergen Status:** If Sunflower Lecithin is used, the product is **Soy-Free**; if Soy Lecithin is used, it must be labeled. Sunflower is recommended for premium positioning.

5.2 Storage & Packaging

Liposomes are sensitive to heat and moisture.

- **Temperature:** Store below 25°C (77°F).
- **Packaging:** Moisture-barrier aluminum foil bags inside fiber drums.

6. Official Technical Data Sheet

TECHNICAL DATA SHEET

PRODUCT IDENTITY

- **Product Name:** Liposomal Melatonin Powder (LiposoMore™)
- **Product Code:** JN-LMT-50
- **Technology:** LiposoMore™ Phospholipid Encapsulation
- **Chemical Name (Active):** N-acetyl-5-methoxytryptamine
- **INCI Name:** Melatonin (and) Lecithin (and) Maltodextrin
- **CAS Number (Melatonin):** 73-31-4
- **Botanical Source:** Synthetic / Fermentation (Nature-Identical)
- **Country of Origin:** China

PRODUCT DESCRIPTION

LiposoMore™ Liposomal Melatonin is a premium, high-potency nutritional raw material designed to revolutionize sleep support formulations. Utilizing proprietary **LiposoMore™ Encapsulation Technology**, this product features high-purity Melatonin wrapped within phospholipid bilayer nanospheres.

Unlike standard melatonin powders, which suffer from low oral bioavailability (~15%) due to extensive first-pass hepatic metabolism, LiposoMore™ mimics the biological structure of human cell membranes. This mechanism facilitates enhanced absorption, potentially bypassing liver degradation via the lymphatic system, and allows for sustained cellular uptake. The result is a highly stable, free-flowing powder with a 50% active payload, ideal for capsules, tablets, and functional drink mixes.

KEY BENEFITS

- **Enhanced Bioavailability:** Phospholipid shielding protects melatonin from gastric acid and enzymatic degradation.
- **Rapid & Sustained Action:** Designed to support reduced sleep latency and prolonged sleep duration through gradual release.
- **High Potency:** Guaranteed ≥50% Melatonin content allows for smaller capsule sizes and formulation flexibility.
- **Superior Stability:** Advanced drying technology ensures a shelf-stable powder, overcoming the oxidation issues common in liquid liposomes.

PHYSICAL & CHEMICAL SPECIFICATIONS

TEST ITEM	SPECIFICATION	METHOD
Appearance	White to off-white free-flowing powder	Visual
Odor & Taste	Characteristic (Slight phospholipid notes)	Organoleptic
Assay (Melatonin)	≥ 50.0%	HPLC
Particle Size	≥ 95% pass 80 mesh	USP
Loss on Drying	≤ 10.0% (Typical: 3.0% - 5.0%)	USP
Bulk Density	0.40 – 0.60 g/mL	USP
Solubility	Dispersible in water (forms colloidal suspension)	Visual

CONTAMINANTS & HEAVY METALS

TEST ITEM	SPECIFICATION	METHOD
Total Heavy Metals	≤ 10.0 ppm	USP
Lead (Pb)	≤ 3.0 ppm	ICP-MS
Arsenic (As)	≤ 1.0 ppm	ICP-MS
Cadmium (Cd)	≤ 1.0 ppm	ICP-MS

Mercury (Hg)	≤ 0.1 ppm	ICP-MS
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MICROBIOLOGICAL CONTROL

TEST ITEM	SPECIFICATION	METHOD
Total Plate Count	≤ 1,000 CFU/g	USP
Yeast & Mold	≤ 100 CFU/g	USP
Escherichia Coli	Negative / 10g	USP
Salmonella	Negative / 25g	USP
Staphylococcus Aureus	Negative / 10g	USP

REGULATORY & COMPLIANCE STATEMENTS

- **Non-GMO Status:** This product is produced from non-genetically modified raw materials and complies with EC Regulations 1829/2003 and 1830/2003.
- **Gluten-Free:** Contains no wheat, rye, barley, or crossbreeds. Verified <20ppm gluten content.
- **BSE/TSE Free:** The product is entirely of non-animal origin and is free from Bovine Spongiform Encephalopathy (BSE) and Transmissible Spongiform Encephalopathy (TSE).
- **Irradiation / EtO:** This product has not been subjected to ionizing radiation or Ethylene Oxide treatment.
- **WADA/Doping:** Free from any substances prohibited by the World Anti-Doping Agency (WADA).
- **Residual Solvents:** Complies with USP limits for Class 1, 2, and 3 solvents.
- **Allergen Statement:**
 - *Option A (Sunflower source): Soy-Free.* Contains no major allergens per FALCPA.
 - *Option B (Soy source): Contains Soy.* Free from Milk, Eggs, Fish, Crustaceans, Tree Nuts, Peanuts, Wheat.

STORAGE & PACKAGING

- **Standard Packaging:** 1kg or 5kg double-layer food-grade PE bags inside Aluminum Foil bags; 25kg Fiber Drum.
- **Storage Conditions:** Store in a cool, dry place, strictly away from direct sunlight and heat.
 - *Recommended Temperature:* Below 25°C (77°F).
 - *Humidity:* Relative Humidity < 60%.
 - *Note:* Phospholipids are sensitive to heat and oxidation. Always keep the container tightly sealed after use.
- **Shelf Life:** 24 months from the date of manufacture when stored in the original unopened package under recommended conditions.

APPLICATION GUIDELINES

- **Recommended Dosage:** 2 mg – 20 mg of LiposoMore™ powder (providing 1 mg – 10 mg of active Melatonin), or as directed by formulation requirements.
- **Usage:** Suitable for Dietary Supplements (Capsules, Tablets), Functional Foods, and Powder Blends.
- **Handling:** Due to the hygroscopic nature of phospholipids, handle in a low-humidity environment to maintain powder flowability.

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