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

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

Technical Data Sheet (TDS) & Scientific White Paper for Liposomal Collagen type II

1. Product Identification & Manufacturer Profile

This Technical Data Sheet (TDS) applies to LiposoMore™ M-Collagen, a premium dietary ingredient manufactured by Joyful Nutritional Supply Co., Ltd..[1] This product is an advanced liposomal collagen powder specifically engineered for B2B dietary supplement manufacturers, contract manufacturing organizations (CMOs), and brand owners seeking verified high bioavailability, gastric comfort, and formulation stability.[1]

By utilizing proprietary microencapsulation and liposomal delivery technology, active Collagen is coated with a protective matrix of starch and phospholipids.[1] This design overcomes traditional formulation limitations associated with raw collagen, such as poor solubility, low absorption efficiency, and unpleasant organoleptic profiles.[1]

Parameter	Product Details & Manufacturer Information
Product Name	Liposomal Collagen [2]
Active Ingredient	Collagen (Type II) [4]
Brand Name	LiposoMore™ M-Collagen [1]
Product Grade	Food Supplements Grade [2]

Standard	In-house Standard [2]
CAS Number	9007-34-5
HS Code	3504.00.90
Manufacturer	Joyful Nutritional Supply Co., Ltd. [5]
Production Address	No. 2045 Songbai Road, Baoan District, Shenzhen, Guangdong, China [5]
Quality Certifications	FSSC 22000 Verified Facility, CNAS Certified Testing Laboratory [6]
Technical Support	TEL: +86-755-23769458 | FAX: +86-755-23769458 [5]

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2. Technical Specifications & Physicochemical Properties

The following quality parameters represent the standard specification profile for each commercial lot of LiposoMore™ M-Collagen. Every production run is subjected to rigorous testing at our CNAS-certified laboratory to ensure compliance with pharmacopeial and international standards [6]:

Items	Specifications	Analytical Methods
Appearance	White Powder, free of peculiar smell, odor, corruption, and mildew, and visible foreign impurities	Visual / Sensory [2]
Odor	Odorless	Organoleptic [2]
Solubility	Dispensible in water	Gravimetric [2]
Collagen Purity	NLT 70% (Typical Result:	HPLC / Biuret Method [2]

	78%)	
Loss on Drying	Under 10.0% (Typical Result: 6.6%)	Gravimetric (105°C, 16 hours) [2]
Total Heavy Metals	Under 10 ppm	ICP-MS [2]
Lead (Pb)	Under 3 ppm	ICP-MS [2]
Mercury (Hg)	Under 0.1 ppm	ICP-MS [2]
Cadmium (Cd)	Under 1.0 ppm	ICP-MS [2]
Arsenic (As)	Under 1.0 ppm	ICP-MS [2]
Total Plate Count	Under 1000 cfu/g	USP [2]
Molds & Yeasts	Under 100 cfu/g	USP [2]
E. Coli	Negative/g	USP [2]
Salmonella	Negative/25g	USP [2]
Staphylococcus Aureus	Negative/25g	In-house [2]

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3. Liposomal Delivery Technology & Nutrient Release Kinetics

3.1 The Biological Barriers of Traditional Type II Collagen

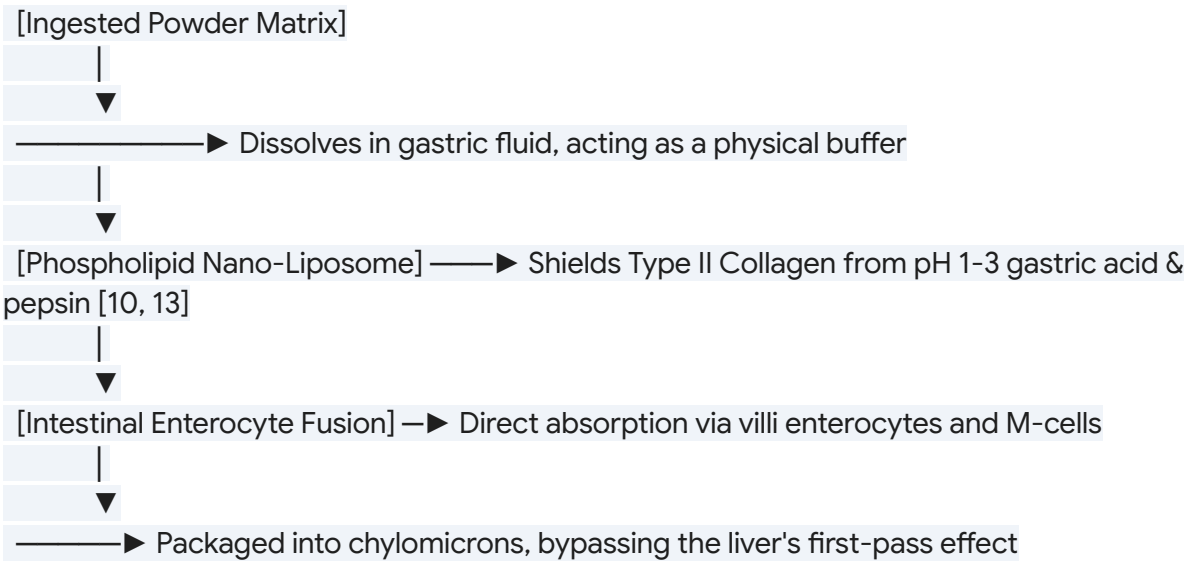
Type II Collagen is the primary structural protein of articular cartilage, accounting for approximately 50% of its total protein content. In its native state, Type II Collagen features a tight, triple-helix structure held together by intramolecular hydrogen bonds between adjacent polypeptide chains.[7] This large molecular architecture makes it highly resistant to proteolytic enzymes and poorly soluble in the gastrointestinal tract.[7]

When ingested through traditional capsules or tablets, these large protein structures must undergo extensive enzymatic breakdown in the stomach.[9] This non-specific digestion often

denatures the crucial bioactive epitopes of the collagen, reducing it to standard amino acids and rendering it ineffective for targeted cartilage support and immune-mediated joint comfort.[4]

3.2 LiposoMore™ Absorption & Lymphatic Bypass Mechanism

To resolve these pharmacokinetic limitations, LiposoMore™ M-Collagen utilizes state-of-the-art liposomal encapsulation.[1] The active Type II Collagen is wrapped within microscopic, spherical vesicles formed by a phospholipid double-layer that mimics the structure of human cell membranes.[1]



1. **Gastric Shielding**: The starch micro-coating serves as a primary physical buffer.[2] Once hydrated, the nano-sized liposomes (precisely engineered between 100 nm and 180 nm) shield the encapsulated collagen from aggressive pH levels (pH 1 to 3) and pepsin enzymes in the stomach.[11]
2. **Membrane Fusion**: Upon reaching the small intestine, the amphiphilic nature of the phospholipid vesicles allows them to merge directly with the membranes of mucosal enterocytes or undergo phagocytosis by microfold (M) cells.[10]
3. **First-Pass Bypass**: Once inside the enterocytes, the liposomes are incorporated into chylomicrons and transported into the lymphatic system.[10] By bypassing the portal vein and liver first-pass metabolism, the bioactive collagen structure enters systemic circulation intact.[10]
4. **Enhanced Efficacy at Micro-Doses**: This protective and targeted transport increases the cellular absorption rate to approximately 90%.[11] Clinical data shows that liposomal

delivery achieves up to 8-fold higher bioavailability compared to traditional un-encapsulated forms.[11] While traditional collagen supplements require bulk daily dosages of 5 g to 15 g to exert structural benefits, LiposoMore™ M-Collagen operates effectively at micro-doses (such as 40 mg of undenatured collagen) by working through systemic immune-modulating pathways.[11]

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4. Physical, Chemical, & Ambient Stability Controls

Liposomal powders are technically complex matrices.[14] Phospholipids, if left unprotected, are sensitive to oxidation, temperature fluctuations, and moisture absorption.[12] LiposoMore™ addresses these issues through careful formulation design and stringent processing parameters.[13]

- **Water Activity (Aw) and Moisture Management**: High moisture content degrades liposomes by accelerating the hydrolytic cleavage of phospholipid ester bonds.[13] By utilizing vacuum spray-drying or freeze-drying with specialized protective saccharides (such as trehalose or maltodextrin), we strictly maintain water activity below critical levels. This prevents vesicle structural rupture and protects the inner collagen from humidity-driven degradation.[13]
- **Hygroscopicity & Caking Prevention**: Raw phospholipids are naturally hygroscopic.[13] If exposed to environmental humidity above 60% relative humidity (RH), they absorb ambient moisture, which can cause particle caking, shell melting, and subsequent leakage of the active payload.[13] LiposoMore™ co-processes saturated phospholipids with anti-hygroscopic starch wall materials, ensuring excellent powder flowability and preventing agglomeration during storage.[13]
- **Zeta Potential & Electrostatic Repulsion**: In aqueous dispersions, the physical stability of LiposoMore™ is maintained by its strong negative Zeta potential (typically optimized between -30 mV and -45 mV). This negative charge generates electrostatic repulsion between the dispersed vesicles, preventing agglomeration, sedimentation, or phase separation, while maintaining consistent viscosity in liquid supplement formats.
- **Thermal Sensitivity**: Liquid and gel liposomes are highly temperature-sensitive and degrade rapidly above 46°C (115°F).[16] However, our dry-powder liposomes are designed for superior heat tolerance.[16] They remain stable under standard room temperature conditions, avoiding the expensive cold-chain logistics required by lower-grade liquid alternatives.[16]

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5. Raw Material Sourcing & Regulatory Compliance Statements

5.1 The Safety and Compliance Advantages of Avian Collagen

The Type II Collagen used in LiposoMore™ M-Collagen is extracted from high-quality chicken sternum cartilage.[18] This choice of raw material offers significant safety and regulatory advantages over mammalian (bovine/porcine) or marine sources [18]:

1. **Absolute Freedom from BSE/TSE Transmission**: Terrestrial mammalian collagens face strict regulatory oversight due to Bovine Spongiform Encephalopathy (BSE) and Transmissible Spongiform Encephalopathy (TSE) risks.[19] Under regulations like EU Regulation (EC) No 999/2001 and US FDA 21 CFR Part 589, bovine materials require rigorous traceability and veterinary certification.[20] Because avian cartilage is naturally free from mammalian prions, chicken-derived Type II collagen is exempt from these high-risk BSE/TSE import barriers, ensuring simplified international customs clearance.[18]
2. **No Zoonotic Disease Concerns**: Chicken cartilage is free from risks of highly contagious mammalian diseases, such as Foot-and-Mouth Disease (FMD) and African Swine Fever, which frequently disrupt porcine and bovine supply chains.[18]
3. **Broad Cultural and Religious Acceptance**: Bovine and porcine collagens are restricted in major global markets due to Hindu, Islamic, and Jewish dietary laws.[18] Avian-derived collagen easily conforms to both Halal and Kosher guidelines, allowing brand owners to formulate products with global market appeal.[18]

5.2 Manufacturer Compliance & Declarations

Joyful Nutritional Supply Co., Ltd. operates a state-of-the-art 100,000 square meter production facility equipped with four intelligent microencapsulation lines.[6] The facility is certified under global food safety management systems, ensuring high-standard traceability for every batch.[1]

- **Non-GMO Statement**: We hereby certify that the Type II Collagen, the starch micro-coating, and the lecithin-derived phospholipids used in the manufacture of LiposoMore™ M-Collagen are obtained from non-genetically modified sources.[22] The production process does not utilize gene-splicing technologies, satisfying global Non-GMO labeling requirements.[24]
- **Allergen-Free Statement**: LiposoMore™ M-Collagen does not contain and is processed entirely free from the major food allergens, including milk, lactose, gluten-containing cereals (wheat, rye, barley), eggs, peanuts, tree nuts, fish, and shellfish.[22]
- **No Nanotechnology**: The liposomal vesicles in this ingredient are created through natural physical self-assembly of phospholipids in water.[10] No persistent, bio-accumulative, artificial nanomaterials are introduced during manufacturing, complying with EC 1223/2009 and European food safety guidelines regarding nanomaterials.[22]
- **Irradiation-Free Statement**: No gamma irradiation, ethylene oxide (EtO), or chemical sterilization is applied to this raw material, maintaining organic compliance standards.[27]

6. Formulation Compatibility & Synergistic Applications

LiposoMore™ M-Collagen is highly versatile and is optimized for modern supplement dosage forms, including capsules, tablets, dry-mix sachets, and functional food bars.[1]

6.1 Scientific Co-Factors and Synergy

To maximize joint, cartilage, and tissue support in finished supplement formulations, LiposoMore™ M-Collagen can be scientifically blended with synergistic co-factors:

Synergistic Active	Biological Mechanism	Targeted Application
Vitamin C (Ascorbic Acid)	Vitamin C serves as an essential cofactor for prolyl hydroxylase and lysyl hydroxylase, which organize collagen peptides into high-tensile fibrillar networks.[4] Blending LiposoMore™ M-Collagen with Liposomal Vitamin C accelerates endogenous collagen synthesis.[1]	Premium Anti-Aging, Joint Repair Powders [28]
Hyaluronic Acid (HA)	Hyaluronic acid is the key glycosaminoglycan responsible for synovial fluid viscosity.[4] Combined with Type II collagen, it creates a "structural frame and fluid cushion" synergy, protecting joints against frictional wear.[4]	Joint Mobility Softgels, Liquid Beauty Shots
Chondroitin Sulfate / Glucosamine	Chondroitin stimulates proteoglycan synthesis and inhibits cartilage-degrading enzymes.[4] When paired with LiposoMore™ Type II	Osteoarthritis & Sports Recovery Tablets

	collagen, it targets both joint inflammation and structural rebuild.	

6.2 Processing & Finished Dosage Advantages

1. **Taste Masking**: Un-encapsulated collagen often possesses a strong, unpleasant animal taste.[12] The lipid membrane of LiposoMore™ effectively traps and locks these off-flavors within the vesicle core.[1] This allows the ingredient to be formulated into chewable tablets, gummies, and instant powder mixes without requiring heavy artificial sweeteners.[1]
2. **Water-Dispersible Powder**: While raw collagen powders can clump or settle at the bottom of a drink, LiposoMore™ M-Collagen is water-dispersible.[2] The hydrophilic starch surface of the micro-capsules allows the powder to disperse rapidly and uniformly into water, forming a stable, homogeneous colloidal suspension.[2]
3. **Optimized Flowability for Clean Manufacturing**: Due to the co-processing of the phospholipids with protective carriers, the powder exhibits excellent flowability and bulk density.[1] It does not stick to high-speed capsule filling or tablet compressing machinery, preventing production downtime and ensuring highly accurate dosage weights.[1]

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7. Storage, Handling, & Packaging Specifications

- **Bulk Packaging**: LiposoMore™ M-Collagen is supplied in commercial quantities of 25 kg net weight, packaged in double food-grade, high-barrier polyethylene inner bags and sealed inside heavy-duty fiber drums.[13]
- **Storage Conditions**: To maintain maximum product stability and prevent caking or phospholipid oxidation, store in the closed original packaging.[13] Store in a cool, dry place, ideally refrigerated at 2 - 8°C.[15] Keep relative humidity (RH) below 60% and protect the product from direct sunlight and heat.[13]
- **Shelf Life**: The ingredient has a shelf life of 24 months (2 years) from the date of manufacture when stored in its original unopened packaging under the recommended storage conditions.

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8. Regulatory Disclaimer

The details provided in this Technical Data Sheet are specific to LiposoMore™ M-Collagen and are accurate to the best of our knowledge as of the date of publication.[26] The information is offered solely for your consideration, investigation, and verification.[26] It is the responsibility of the purchaser and formulation chemist to ensure that the final finished product complies with local regulatory rules, including country-specific dietary supplement labeling guidelines, and

that all structure/function claims are supported by adequate scientific evidence.[2]