Magnesium Sulfate ($MgSO_4$) Application Integration Manual (For Foreign Trade Business)

I. Industrial Sector (Key Foreign Trade Export Scenario)

Detailed Application Description

- **Chemical Raw Material**: Serves as the basic raw material for producing magnesium salts such as magnesium oxide, magnesium hydroxide, and magnesium carbonate; used as a flame-retardant filler in ABS resins and plastics to enhance flame retardancy.
- **Fireproof Materials**: Added to fireproof coatings, fireproof panels, and fireproof fabrics. It releases crystal water to absorb heat at high temperatures, delaying flame spread and improving the flame-retardant effect of materials.
- **Textile Dyeing Industry**: Acts as a mordant for cotton, linen, and silk fabrics, enhancing the binding force between dyes and fibers to achieve uniform dyeing and improved color fastness; also used as a fabric weighting agent to increase fabric weight and texture.
- **Water Treatment**: Utilized in industrial wastewater treatment to remove heavy metal ions (e.g., Pb^{2+}, Cd^{2+}) and phosphate through chemical reactions, preventing eutrophication; also serves as a boiler water softener to reduce water hardness and avoid scale deposition.
- **Other Applications**: Sizing agent in papermaking to improve paper strength and water resistance; additive in electroplating solutions to enhance coating adhesion and uniformity; concrete admixture to improve concrete strength and frost resistance.

Structured Information Table

Application Direction	Specific Uses	Suitable Product Grade	Target Customer Type
Chemical Raw Material	Production of magnesium oxide, magnesium hydroxide, magnesium carbonate, etc.; flame-retardant filler for ABS resins and plastics	Industrial Grade ≥98%	Chemical synthesis plants, plastic/resin manufacturers
Fireproof Materials	Additive for fireproof coatings, fireproof panels, and fireproof fabrics; heat absorption and flame retardancy at high temperatures	Industrial Grade ≥98%	Fireproof material manufacturers, building materials enterprises
Textile Dyeing Industry	Mordant for cotton/linen/silk fabrics (enhancing dye adhesion), fabric weighting agent	Industrial Grade ≥98%	Dyeing factories, textile auxiliary companies
Water Treatment	Heavy metal and phosphate removal from industrial wastewater; boiler water softener	Industrial Grade ≥95%	Sewage treatment plants, thermal power companies
Other Industrial Applications	Papermaking sizing agent, electroplating solution additive, concrete admixture	Industrial Grade ≥95%	Paper mills, electroplating factories, building materials companies

II. Agricultural Sector (Stable International Demand Scenario)

Detailed Application Description

- **Foliar/Soil Fertilizer**: Rich in essential magnesium (core component of chlorophyll) and sulfur for plants. Can be directly sprayed on crop leaves or applied to soil to quickly supplement nutrients, preventing and treating crop magnesium deficiency (yellowing leaves, slow growth, low fruiting rate). Suitable for various crops such as rice, cotton, fruit trees (apples, citrus), vegetables (tomatoes, cucumbers), and tobacco, improving yield and quality.
- **Aquaculture**: Regulates the pH value and hardness of aquaculture water, provides mineral nutrition for aquatic organisms such as fish and shrimp, improves the breeding environment, and reduces disease occurrence; prevents skeletal deformities and slow growth in fish caused by magnesium deficiency.
- **Feed Additive**: Serves as a magnesium supplement in livestock and poultry feed, promoting animal bone development and normal neuromuscular function, improving feed conversion rate, and enhancing breeding benefits (must meet feed grade standards).

Structured Information Table

Application Direction	Specific Uses	Suitable Product Grade	Target Customer Type
Crop Fertilizer	Foliar/soil fertilizer, supplementing magnesium and sulfur, preventing magnesium deficiency; suitable for rice, cotton, fruit trees, vegetables, etc.	Agricultural Grade ≥95%	Agricultural material distributors, farms, planting bases
Aquaculture	Regulating water pH and hardness, providing mineral nutrition, improving fish and shrimp breeding environment	Agricultural Grade ≥95%	Aquaculture farms, aquatic pharmaceutical companies
Feed Additive	Magnesium supplement for livestock and poultry feed, promoting bone development and improving feed conversion rate	Feed Grade ≥98%	Feed factories, breeding enterprises

III. Medical & Food Sectors (High-Value Export Scenario)

Detailed Application Description

1. Medical Applications

- **Topical Use**: 50% concentration magnesium sulfate solution for wet compresses can relieve local soft tissue swelling and inflammation (e.g., sprains, contusions, phlebitis), reducing edema through osmotic pressure and promoting inflammation resolution.
- **Oral Use**: Acts as a laxative for treating constipation by absorbing intestinal water to soften feces and promote intestinal peristalsis; also used as a cholagogue to stimulate bile secretion and aid digestion.
- **Injection**: 25% concentration magnesium sulfate injection is clinically used to treat convulsions

caused by pregnancy-induced hypertension syndrome and eclampsia, lower blood pressure, and relieve smooth muscle spasm; also used to treat hypomagnesemia by supplementing magnesium ions in the body.

2. Food Additive

- **Coagulant**: Used in the production of soybean products such as tofu and dried tofu, replacing traditional gypsum to make soybean products have a smoother texture and better elasticity, improving product quality.
- **Nutritional Fortifier**: Added to beverages, dairy products, cereal products, etc., to supplement essential magnesium for the human body and meet nutritional needs.
- **Stabilizer**: Used in ice cream, chocolate, jam, etc., to improve product texture stability, prevent stratification and caking, and enhance taste.

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Application Direction	Specific Uses	Suitable Product Grade	Target Customer Type
Medical Applications	Topical wet compress for swelling and inflammation; oral laxative/cholagogue; injection for convulsion relief, blood pressure reduction, and hypomagnesemia treatment	Pharmaceutical Grade ≥99.5%	Pharmaceutical manufacturers, hospitals, medical device companies
Food Additive	Coagulant for soybean products; nutritional fortifier for beverages/dairy products; stabilizer for ice cream/chocolate	Food Grade ≥99.0%	Food processing factories, beverage enterprises

IV. Other Sectors

Detailed Application Description

- **Daily Chemical Industry**: Used in cleaning products such as bath salts and scrubs for gentle cleansing and exfoliation; added to moisturizers and body lotions to soothe skin, supplement minerals, and improve dry skin conditions.
- **Laboratory Use**: Anhydrous magnesium sulfate serves as a high-efficiency desiccant for drying liquid reagents (e.g., ethanol, ether, acetone) in organic synthesis and chemical analysis. It forms magnesium sulfate heptahydrate after absorbing water, with excellent drying effect and no easy reaction with reagents.

Structured Information Table

Application Direction	Specific Uses	Suitable Product Grade	Target Customer Type
Daily Chemical	Cleansing component in bath	Cosmetic Grade ≥99%	Daily chemical

Application Direction	Specific Uses	Suitable Product Grade	Target Customer Type
Industry	salts and scrubs; soothing/moisturizing additive in moisturizers and body lotions		factories, cosmetics companies
Laboratory Use	Desiccant for liquid reagents in organic synthesis (anhydrous magnesium sulfate)	Reagent Grade ≥99.8%	Research institutions, laboratory supplies suppliers

Core Tips for Foreign Trade Business

1. When communicating with customers, prioritize confirming their specific use cases to accurately recommend the corresponding product grade (e.g., emphasize GMP certification for medical use and provide FDA/REACH compliance certificates for food use).

2. For large industrial/agricultural orders, clarify packaging requirements (25kg woven bags/ton bags); for medical/food grades, specify sterile packaging, certification qualifications, and shelf life.

3. Key export markets and demand focus: Southeast Asia/Middle East (agricultural and industrial grades), Europe/North America (food and pharmaceutical grades), Japan/South Korea (high-purity industrial and cosmetic grades). Adjust quotations based on market demand.

4. Prepare supporting export documents: MSDS, COA (Certificate of Analysis), product grade certification certificates. For medical/food grades, additional industry compliance certificates (e.g., GMP, FDA) are required to avoid customs clearance delays.