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Technical Data Sheet (TDS)

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Product Name: Ferrous Sulphate Heptahydrate (Feed Grade)**CAS Number:** 7782-63-0

1. Product Overview

Ferrous Sulphate Heptahydrate ($FeSO_4 \cdot 7H_2O$) is a highly bioavailable source of elemental iron (Fe), an essential trace mineral for animals. It is manufactured via the reaction of high-purity sulfuric acid and iron metal, followed by crystallization.

In animal nutrition, it is used to prevent and treat iron deficiency anemia, which is critical for hemoglobin synthesis, oxygen transport, immune function, and growth. As a feed grade additive, it offers the highest water solubility among iron salts, ensuring rapid absorption in the gut.

2. Chemical & Physical Properties

Property	Typical Value
Chemical Name	Iron (II) Sulphate Heptahydrate
CAS No.	7782-63-0
Formula	$FeSO_4 \cdot 7H_2O$
MW	278.01 g/mol
Fe Content	20.0% - 20.5%
Appearance	Bluish-green crystals
Solubility	Soluble in water (25.5 g/100 mL)
pH (5% Solution)	3.5
Density	1.89 g/cm³
Stability	Oxidizes to Fe^{3+} (brown) in air/moisture

3. Quality Specifications

Test Item	Feed Grade Standard
Assay ($FeSO_4 \cdot 7H_2O$)	≥ 98.0%
Iron (Fe)	≥ 20.0%
Acid Insoluble Matter	≤ 0.05%
Arsenic (As)	≤ 2 ppm
Lead (Pb)	≤ 10 ppm
Cadmium (Cd)	≤ 2 ppm
Mercury (Hg)	≤ 0.1 ppm
Loss on Drying	42.0% - 45.0%

4. Product Advantages

1. **High Bioavailability:** Contains iron in the ferrous (Fe^{2+}) form, which is the most easily absorbed form by monogastric animals.
2. **Cost-Effective:** Economical source of supplemental iron compared to chelated forms.
3. **Water Soluble:** Dissolves quickly, making it suitable for both dry feed and liquid supplementation (e.g., piglet iron dextran alternatives).

4. **Strict Purity:** Low heavy metal content meets the strictest global feed safety standards.

5. Applications & Recommended Dosage

Primarily used for swine (preventing baby pig anemia), poultry, and aquaculture. **Note: Dosages are low due to the potency of iron.**

Animal Species	Application	Dosage (per ton of feed)
Swine	Weaned Piglets	100 - 200 g
	Sows (Late Gestation)	80 - 150 g
Poultry	Broilers	50 - 100 g
	Layers (Egg Production)	40 - 80 g
Aquaculture	Fish/Shrimp	200 - 500 g
Ruminants	Calves	50 - 100 g

6. Handling & Mixing Guidelines

1. **Oxidation Prevention:** The product is sensitive to air and moisture. **Use immediately after opening**. Do not store opened bags for extended periods.
2. **Mixing:** Due to the low dosage, it is critical to pre-mix the ferrous sulfate with a carrier (e.g., corn starch or premix) in a 1:20 ratio before adding to the main feed batch to ensure homogeneity.
3. **Pelleting:** Stable during pelleting temperatures up to 80°C. However, avoid contact with steam condensate to prevent oxidation.
4. **Incompatibilities: Do not mix** with alkaline ingredients (e.g., limestone, DKP) in concentrated form, as this will cause the iron to precipitate and become unavailable.

7. Packaging & Storage

7.1 Packaging

- **Standard Pack:** 25 kg multi-ply paper bags with a thick inner PE liner (moisture-proof).
- **Bulk Pack:** 500 kg / 1000 kg FIBC bulk bags with PE liners and moisture barriers.
- **Special:** Vacuum packaging available for long-term storage upon request.

7.2 Storage (Critical for Potency)

- **Conditions:** Store in a cool, dry, well-ventilated warehouse. **Protect from air and moisture**.
- **Shelf Life:** 12 months unopened. **Discard if product turns brown** (indicates oxidation to ferric iron, which is poorly absorbed).
- **After Opening:** Reseal the bag tightly using a heat sealer or heavy-duty clips. Use within 7 days.

8. Regulatory Compliance

- **China:** GB/T 10648-2013 (Feed Additives), GB 13078-2017 (Hygiene Standard).
- **EU:** Regulation (EC) No 1831/2003, REACH Registered.
- **USA:** FDA 21 CFR § 573.320 (Iron Supplements).
- **Warning:** For animal feed use only. Not for human consumption.