

SAFETY DATA SHEET

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

Product Sulphate of Iron

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Principle use: As the active ingredient in a moss killer or for use as a fertiliser.

2. COMPOSITION/INFORMATION ON INGREDIENTS

Generic Name : Dried Copperas.
Product Name : Sulphate of Iron.
Commonly Used Synonyms : Iron Sulphate, Iron(II) Sulphate, Dried Copperas, Ferrous Sulphate Heptahydrate ($\text{FeSO}_4 \times 7\text{H}_2\text{O}$)
Chemical Family : Inorganic solid

Ingredient	% (w/w typical)	EINECS Number	CAS Number	Symbol	Classification and R phrase
Ferrous Sulphate Heptahydrate	53%	231-753-5	7720-78-7	Xn	R22
Sulphuric Acid	<1	231-639-5	7664-93-9	N/A	OEL assigned (see section 8). Sulphuric acid is not classified and has no R phrase at concentrations below <5%.

3. HAZARDS IDENTIFICATION

Classification : Harmful
Main hazards : Harmful if swallowed, may be irritating to eyes and skin.
Other hazards : Drainage from bulk material will be acidic. Excessive levels in water systems may result in oxygen depletion.

4. FIRST AID MEASURES

- Inhalation : If exposed to excessive levels remove to fresh air and seek medical attention if cough or other symptoms develop..
- Skin Contact : Wash the affected area with water.
- Eye Contact : Immediately irrigate with eyewash solution or clean water, holding the eyelids apart for at least ten minutes. Obtain medical attention.
- Ingestion : No hazards in normal industrial use. If significant quantities are accidentally ingested seek medical help.

5. FIRE FIGHTING MEASURES

- Flammability : Not flammable
- Extinguishing Media : As appropriate for surrounding fire
- Exposure hazards : If heated to decomposition emits toxic fumes of sulphur dioxides.
- Protection of fire-fighters : Wear approved self-contained breathing apparatus. Wear appropriate protective clothing to prevent contact with skin and eyes.

6. ACCIDENTAL RELEASE MEASURES

- Personal precautions : Wear personal protection equipment as described in section 8.
- Environmental precautions: Avoid contamination of water courses and drains and inform the appropriate authority in case of accidental contamination of watercourses. Excessive levels in water system may result in oxygen depletion.
- Clean-up procedures : Sweep and shovel up. Avoid contamination of natural water resources. Neutralise solutions with soda ash.
- Disposal : Depending on the degree and nature of contamination, dispose of, by use as a fertiliser or to an authorised waste facility.

Also see sections 8 & 13

7. HANDLING AND STORAGE

- Handling requirements : Avoid contact with eyes and skin. If the conditions result in the generation of dust use respirator.
- Storage conditions: : Keep dry. The floor of the store must be impermeable to prevent the escape of liquids. Drainage from bulk material will be acidic. Avoid contamination of natural water resources.
- : Store in original close packing
 - : Ensure high standard of housekeeping in the storage area.
 - : Any building used for the storage should be dry and well ventilated.

Also see section 10

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational exposure controls:

Atmospheric levels should be controlled within occupational exposure limits.

Exposure Limits				
	TWA (8Hr exposure Limit)		STEL (15min exposure limit)	
	Ppm	Mg/m ³	Ppm	Mg/m ³
Iron salts (UK EH40, Eire)		1		2
	Level limit Ceiling Limit (LLV)			
Iron Oxide (as Fe) respirable dust (Sweden)		3.5		

Environmental Exposure Controls:

Avoid contamination of natural water resources. Excessive levels in water system may result in oxygen depletion.

Hand Protection:

The following glove materials meeting CEN standards are suitable for handling this product.

Material	Thickness	Breakthrough time	CEN Standards
PVC	1.5mm	>480 minutes	EN 420 and EN 374
Natural Rubber	1.3mm	>480 minutes	EN420 and EN 374
Nitrile	0.85mm	> 480 minutes	EN420 and EN 374

Glove selection should consider the risk of physical damage as well as chemical breakthrough times.

Eye Protection:

Suitable eye protection will be dependent on level of exposure.

Exposure Risk	Suitable PPE	CEN Standards
<OEL	Safety spectacles	EN 166
>OEL	Safety goggles or respirator with integral eye protection	EN166

Skin protection:

Protect skin from exposure.

Exposure Risk	Suitable PPE	CEN Standards
Routine Use	Usual Workwear	

Respiratory Protection:

If exposure is likely to exceed OEL concentrations, the following table specifies suitable respiratory protection.

Multiple of OEL	Standard	Suitable type of Respiratory Protection
Up to 10 times OES	EN 149	Filtering half mask, FFP2 filter
	EN 140 for mask	Half mask or quarter mask, FFP filter
	EN 136 for mask	Full face mask with P2 filter
	EN 12941 for hood or helmet	Powered particle filtering device incorporating a helmet or hood with filter class THP1
	EN12942 for mask	Powered assisted particle filtering device incorporating a full face mask, half mask or quarter mask with TM2 filter

Up to 20 times OES	EN 149	Filtering half mask, FFP3 filter
	EN 136 for mask	Full face mask with P3 filter
	EN140 for mask	Half mask or quarter mask with P3 filter
	EN12941 for hood or helmet	Powered particle filtering device incorporating a helmet or hood with filter class THP2
	EN12942 for mask	Powered particle filtering device incorporating a full face mask, half mask or quarter mask with TM3 filter
Up to 40 times OES	EN12941 for hood or helmet	Powered particle filtering device incorporating a helmet or hood with filter class THP3
	EN12942 for mask	Powered assisted particle filtering device incorporating a full face mask only with TM3 filter.
	EN136 for mask	Full face mask with P3 filter
Note: The appropriate filters for use with the respirators are EN143 (for particulate filters) and EN141 (for combination filters, where particles and gases or vapours are present).		

Engineering controls and safe systems of work should be used in preference to PPE to minimize the risk of exposure.

The above recommendations for PPE are only intended as a guide for handling the specified product in this safety data sheet. It is the responsibility of the user to undertake a comprehensive risk assessment to ascertain the suitability of all PPE under the particular circumstance of use.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	: Pale green crystalline solid
Odour	: Recognisable
PH value at 20 deg C	: 0 (solub.)
Boiling point/boiling range:	Dehydration occurs at 600°C
Melting point	: Partial loss of water occurs at 64 oC
Flash point	: N/A
Flammability	: Non-flammable
Explosive properties	: N/A
Oxidising properties	: Non-oxidising (as defined by EC criteria)
Vapour pressure	: No data available
Bulk Density at 20 deg C	: 800-900kg/m ³
Solubility	: <i>Water solubility at 10 deg C</i> : 365 g/l : <i>Fat solubility.</i> The substance has not been assessed for this endpoint.
Partition coefficient	: <i>n-octanol/water.</i> Log P _{ow} -3.32 (calculated)
Viscosity	: 3 mPas
Evaporation rate	: N/A
Solids content	: 100%

10. STABILITY AND REACTIVITY

Stability : Stable under normal conditions
Materials to avoid : Will generate NO_x when in contact with ammonium nitrate. Can act as a reductor with strong oxidising agents
Hazardous decomposition products: If heated to decomposition emits toxic fumes of sulphur di-oxides.

11. TOXICOLOGICAL INFORMATIONAcute toxicity applicable to 7720-78-7 iron sulphate classification

Oral : Large doses in humans may cause severe liver damage. Children are more susceptible than adults to iron poisoning.
LD50 oral rat 1480mg/kg
(as Fe).

Inhalation : No standard test data available. Fe salts are subject to OEL.
(see section 8)

Skin : Moderate skin irritation

Corrosivity/irritation

Eye : Sulphuric acid content is below irritant classification level but the mildly acidic particle may still cause eye irritation.

Skin : Unlikely to cause irritation to the skin but may cause discoloration.

Respiratory Tract: No standard test data available, however ferrous sulphate has been widely used for many years and there is no evidence of respiratory tract corrosivity/irritation.

Sensitisation

Skin : Not sensitising based on mouse local lymph node assay.

Respiratory Tract: No standard test data available, however ferrous sulphate has been widely used for many years and there is no evidence of respiratory tract sensitisation.

Larger amounts of ferrous sulphate can be reabsorbed through the intestines and may induce a paralysis similar to magnesium narcosis.

Ingestion of toxic amounts of iron sulphate leads to sanguinolent vomiting, hypotonia, hyporeflexia, tarry stool. Gastric strictures may develop

Repeated-Dose Toxicity

No standard test data available, however ferrous sulphate has been used as an iron supplement for humans for many years.

Mutagenicity

No evidence of mutagenicity. Maternal toxicity, NOAEL rat 10 day 160mg/kg

Carcinogenicity

The lack of epidemiological evidence over the long use of ferrous sulphate implies that ferrous sulphate is not carcinogenic.

Reproductive Toxicity

No evidence of reproductive toxicity.

12. ECOLOGICAL INFORMATION

Ecotoxicity : May have adverse affects on aquatic organisms.

Ecotoxicity Data			
Species	Time	Test	Result
Rainbow Trout (Onchorhynchus mykiss)	96h	LC ₅₀ (OECD 203)	82.3mg/l

Mobility : Soluble in water. Ferrous sulphate has a high mobility in soil and sediments (based on partition coefficient results).

Persistence and Degradability : Product is inorganic and therefore non biodegradable, but will degrade as a result of hydrolysis.

Bioaccumulative potential : Octanol/water partition coefficient (Pow) indicates that ferrous sulphate has a very low bioaccumulative potential.

Other adverse effects : None known.

13. DISPOSAL CONSIDERATIONS

Regulatory considerations : Dispose of in accordance with local regulations using a licensed waste contractor. Ferrous sulphate would require disposal as a 'special waste' under UK regulations.

Disposal : Sweep and shovel up, if appropriate, moisten first to prevent dusting, transfer to a suitable sealable container and dispose using a licensed waste contractor. Do not allow ferrous sulphate-heptahydrate to enter any watercourse.

Transport : See Section 6.

14. TRANSPORT INFORMATION

Key Transport data		ROAD/RAIL (ADR/RID)	
Class:	N/A	ADR class:	N/A
Packing group:	N/A	Hazard ID number:	N/A
Subsidiary hazard:	N/A	ADR/RID Sin:	N/A
UN number:	N/A	Classification code:	N/A
		Hazard label:	N/A
SEA (IMDG/IMO)		AIR (ICAO/IATA)	
Proper shipping name:	N/A	ICAO/IATA class:	N/A
IMO class:	N/A	Proper shipping name:	N/A
Risk label:	N/A	Hazard label:	N/A
Subsidiary hazard:	N/A	Packing group:	N/A
Marine pollutant:	N/A		

15. REGULATORY INFORMATION

Hazard symbol : Xn
Risk phrases : R22 Harmful if swallowed



Safety phrases :
S26 In case of contact with eyes, rinse immediately with water and seek medical advice.
S36/37/39 Wear suitable protective clothing, gloves and eye/face protection.
S46 If swallowed seek medical advice immediately and show this container or label.
S2 Keep out of reach of children.
EINECS number : 231-753-5

Occupational Exposure Limits: Yes (see section 8)

16. OTHER INFORMATION

The information contained in the Safety data sheet is correct to the best of our knowledge at the date of issue. It is intended as a guide for the safe use, handling, disposal, storage and transportation and is not intended as warranty or as a specification. The information relates only to the product specified and may not be suitable for combinations with other materials or in processes other than those specifically described herein. While certain hazards are described in this publication, no guarantee is made that these are exhaustive. Hazards, toxicity and behaviour of the product may differ when used with in conjunction with other materials, in different processes or under different conditions.

"To avoid risk to man and the environment, comply with the instructions for use"

Westland Horticulture Limited do not accept responsibility for damage caused by incorrect use of this information.

Training and related advice: This document contains important information to ensure the safe storage, handling and use of this product. It is the responsibility of your organization to ensure that the information contained in this document is communicated to the end user and that all necessary training to enable the product to be used correctly has been given.

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HSE (1995). Respiratory Protective Equipment. Legislative requirements and lists of HSE approved standards. HMSO. Norwich.

EN 166:2001. Personnel eye protection: Specifications. European Committee for Standardization (CEN).

EN 420:1994 General requirements for gloves. European Committee for Standardization (CEN).

EN 374-1:1994 Protective gloves against chemicals and micro-organisms – Part 1: Terminology and performance requirements. European Committee for Standardization (CEN).

EN 466:1995 Protective clothing. Protection against liquid chemicals. Performance requirements for chemical protective clothing with liquid-tight connections between different parts of the clothing (type 3 equipment) European Committee for Standardization (CEN).

EN 465:1995 Protective clothing. Protection against liquid chemicals. Performance requirements for chemical protective clothing with spray-tight connections between different parts of the clothing (type 4 equipment) European Committee for Standardization (CEN).

EN 149:2001 Respiratory protection devices. Filtering half masks to protect against particles. Requirements, testing, marking. European Committee for Standardization (CEN).

EN 140:2001 Respiratory protection devices. Half masks and quarter masks. Requirements, testing, marking. European Committee for Standardization (CEN).

EN 136:1998 Respiratory protection devices. Full face masks Requirements, testing, marking. European Committee for Standardization (CEN).

EN 12941:1999 Respiratory protection devices. Powered filtering devices incorporating a helmet or hood. Requirements, testing, marking. European Committee for Standardization (CEN).

EN 12942:1999 Respiratory protection devices. Power assisted filtering devices incorporating full face masks, half mask or quarter masks. Requirements, testing, marking. European Committee for Standardization (CEN).

EN 143:2000 Respiratory protection devices. Particle filters. Requirements, testing, marking. European Committee for Standardization (CEN).

EN 141:2000 Respiratory protection devices. Gas filters and combined filters. Requirements, testing, marking. European Committee for Standardization (CEN).

NIOSH Pocket Guide to Chemical Hazards (www.cdc.gov/niosh)

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