



## SAFETY DATA SHEET MANGANESE SULPHATE

According to Regulation (EU) No 453/2010

### SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

#### 1.1. Product identifier

Product name	MANGANESE SULPHATE
Product No.	M05
REACH Registration number	01-2119456624-35
REACH Registration notes	According to REACH Annex V, paragraph 6; the hydrates of a substance are covered by the registration of the anhydrous material.
CAS-No.	10034-96-5
EU Index No.	025-003-00-4
EC No.	232-089-9

#### 1.2. Relevant identified uses of the substance or mixture and uses advised against

Identified uses	Construction Products. Fertilisers. Base metals and alloys. Cosmetics personal care products. Surface Treatment Products. Water Treatment. Washing and Cleaning Products. Chemical Processing Aids. "Leather tanning, dye, finishing, impregnation and care products". Unloading, packaging and cleaning at industrial sites. Some grades of this substance are available for feed/food use; (E5) Feed additive.
Uses advised against	The identified uses have process categories which are advised against – see annex to the SDS.

#### 1.3. Details of the supplier of the safety data sheet

Supplier	Norkem Limited, Norkem House, Bexton Lane, Knutsford, Cheshire, WA16 9FB. UK. T: + 44 (0)1565 755550 F: + 44 (0)1565 755496 datasheet@norkem.com
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#### 1.4. Emergency telephone number

T: 01270 502891 (UK Transport emergencies only)

### SECTION 2: HAZARDS IDENTIFICATION

#### 2.1. Classification of the substance or mixture

##### Classification (EC 1272/2008)

Physical and Chemical Hazards	Not classified.
Human health	Eye Dam. 1 - H318; STOT RE 2 - H373
Environment	Aquatic Chronic 2 - H411

##### Classification (67/548/EEC)

Xn; R48/20/22. N; R51/53.

The Full Text for all R-Phrases and Hazard Statements are Displayed in Section 16.

#### 2.2. Label elements

EC No. 232-089-9  
Label In Accordance With (EC) No. 1272/2008



**MANGANESE SULPHATE**

<b>Signal Word</b>	Danger	
<b>Hazard Statements</b>	H318	Causes serious eye damage.
	H373	May cause damage to organs Brain through prolonged or repeated exposure if inhaled.
	H411	Toxic to aquatic life with long lasting effects.
<b>Precautionary Statements</b>	P260	Do not breathe dust/fume/gas/mist/vapours/spray.
	P273	Avoid release to the environment.
	P280	Wear protective gloves/protective clothing/eye protection/face protection.
	P305+351+338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
	P314	Get medical advice/attention if you feel unwell.
	P501	Dispose of contents/container in accordance with regional regulations.
<b>Supplementary Precautionary Statements</b>	P310	Immediately call a POISON CENTER or doctor/physician.
	P391	Collect spillage.

**2.3. Other hazards**

This product does not contain any PBT or vPvB substances.

**SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS****3.1. Substances**

<b>Product name</b>	MANGANESE SULPHATE
<b>REACH Registration number</b>	01-2119456624-35
<b>REACH Registration notes</b>	According to REACH Annex V, paragraph 6; the hydrates of a substance are covered by the registration of the anhydrous material.
<b>CAS-No.</b>	10034-96-5
<b>EU Index No.</b>	025-003-00-4
<b>EC No.</b>	232-089-9
<b>Gross Formula</b>	MnSO4
<b>Ingredient notes</b>	
	Substance is inorganic
<b>Composition Comments</b>	
	Purity >90, <100% w/w

**SECTION 4: FIRST AID MEASURES****4.1. Description of first aid measures****General information**

Get medical attention if any discomfort continues.

**Inhalation**

Move the exposed person to fresh air at once. Get medical attention. Provide rest, warmth and fresh air. When breathing is difficult, properly trained personnel may assist affected person by administering oxygen.

**Ingestion**

DO NOT INDUCE VOMITING! NEVER MAKE AN UNCONSCIOUS PERSON VOMIT OR DRINK FLUIDS! Remove victim immediately from source of exposure. Drink plenty of water. Get medical attention immediately! Provide rest, warmth and fresh air.

**Skin contact**

Remove affected person from source of contamination. Get medical attention promptly if symptoms occur after washing. Remove contaminated clothes and rinse skin thoroughly with water.

**Eye contact**

Remove victim immediately from source of exposure. Make sure to remove any contact lenses from the eyes before rinsing. Promptly wash eyes with plenty of water while lifting the eye lids. Get medical attention immediately. Continue to rinse.

**4.2. Most important symptoms and effects, both acute and delayed****Inhalation**

Irritation of nose, throat and airway. Prolonged or frequent inhalation of vapours in high concentrations may cause permanent damage to the nervous system, including the brain.

**Ingestion**

May cause gastrointestinal irritation. Diarrhoea. Nausea, vomiting.

## MANGANESE SULPHATE

### Skin contact

May cause skin irritation/eczema. (The hazard is low for usual industrial handling).

### Eye contact

May cause blurred vision and serious eye damage.

### 4.3. Indication of any immediate medical attention and special treatment needed

No specific first aid measures noted.

## SECTION 5: FIREFIGHTING MEASURES

### 5.1. Extinguishing media

#### Extinguishing media

Use fire-extinguishing media appropriate for surrounding materials. Water spray, fog or mist.

#### Unsuitable extinguishing media

Extinguishers of the chlorinated hydrocarbon variety are not recommended as toxic products may be produced by the decomposition of the extinguishing medium when it comes into contact with hot manganese compounds.

### 5.2. Special hazards arising from the substance or mixture

#### Specific hazards

When heated and in case of fire, irritating vapours/gases may be formed. In case of fire, toxic gases may be formed.

### 5.3. Advice for firefighters

#### Special Fire Fighting Procedures

Keep run-off water out of sewers and water sources. Dike for water control.

#### Protective equipment for fire-fighters

Self contained breathing apparatus and full protective clothing must be worn in case of fire.

## SECTION 6: ACCIDENTAL RELEASE MEASURES

### 6.1. Personal precautions, protective equipment and emergency procedures

Provide adequate ventilation. Use protective gloves, goggles and suitable protective clothing.

### 6.2. Environmental precautions

Do not discharge onto the ground or into water courses.

### 6.3. Methods and material for containment and cleaning up

Do not contaminate water sources or sewer. Remove spillage with vacuum cleaner. If not possible, collect spillage with shovel, broom or the like. Ensure that waste and contaminated materials are collected and removed from the work area as soon as possible in a suitably labelled container.

### 6.4. Reference to other sections

Wear protective clothing as described in Section 8 of this safety data sheet. See section 11 for additional information on health hazards.

## SECTION 7: HANDLING AND STORAGE

### 7.1. Precautions for safe handling

Avoid spilling, skin and eye contact. Use mechanical ventilation in case of handling which causes formation of dust. Avoid inhalation of dust. Wash hands before eating. Wear full protective clothing for prolonged exposure and/or high concentrations.

### 7.2. Conditions for safe storage, including any incompatibilities

Store in a cool and well-ventilated place. Store in a dry place. Keep containers tightly closed.

### 7.3. Specific end use(s)

For further information see attached Exposure Scenario. The identified uses for this product are detailed in Section 1.2.

## SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

### 8.1. Control parameters

Name	STD	TWA - 8 Hrs		STEL - 15 Min		Notes
MANGANESE SULPHATE	WEL		0,5 mg/m <sup>3</sup>			

**MANGANESE SULPHATE**

WEL = Workplace Exposure Limit.

**DNEL**

Industry	Dermal	Long Term	4.14	µg/kg/day
Industry	Inhalation.	Long Term	0.2	mg/m <sup>3</sup>
Consumer	Dermal	Long Term	2.1	µg/kg/day
Consumer	Inhalation.	Long Term	0.043	mg/m <sup>3</sup>

DNELs for the oral route, all "acute effects" and for "long-term local-effects" were not calculated and are not required for the "identified uses" covered in this SDS and the Chemical Safety Report (CSR).

**PNEC**

Freshwater	0.0128	mg/l
Marinewater	0.4	µg/l
Spills(freshwater)	30	µg/l
Sediment (Freshwater)	11.4	µg/kg
Sediment (Marinewater)	1.4	µg/kg
Soil	25.1	mg/kg
STP	56	mg/l

Soil & sediment PNEC values are mg/kg wet weight.

**8.2. Exposure controls****Protective equipment****Engineering measures**

Provide adequate general and local exhaust ventilation. Provide adequate ventilation. Observe occupational exposure limits and minimize the risk of inhalation of dust. The risk management measures that adequately control exposure of the environment are set out in the exposure scenarios in the annex to this Safety Data Sheet.

**Respiratory equipment**

Respiratory protection must be used if air contamination exceeds acceptable level. In case of inadequate ventilation or risk of inhalation of dust, use suitable respiratory equipment with particle filter (type P2).

**Hand protection**

Use suitable protective gloves if risk of skin contact. Wear suitable chemical resistance gloves approved to EN 374.

**Eye protection**

Wear tight-fitting goggles or face shield. Recommended: EN 166.

**Other Protection**

Provide eyewash, quick drench.

**Hygiene measures**

DO NOT SMOKE IN WORK AREA! Wash hands at the end of each work shift and before eating, smoking and using the toilet. Wash promptly if skin becomes wet or contaminated. Promptly remove any clothing that becomes contaminated. When using do not eat, drink or smoke.

**Personal protection**

For further information see attached Exposure Scenario.

**Skin protection**

Wear appropriate clothing to prevent reasonably probable skin contact.

**SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES****9.1. Information on basic physical and chemical properties**

<b>Appearance</b>	Powder, dust
<b>Colour</b>	Pale pink.
<b>Odour</b>	Odourless.
<b>Solubility</b>	Soluble in water.
<b>Initial boiling point and boiling range (°C)</b>	850 °C 760 mm Hg
<b>Melting point (°C)</b>	Scientifically unjustified.
	Unjustified as the melting point > 300°C.
<b>Relative density</b>	2.95
<b>Vapour pressure</b>	1x 10 <sup>-6</sup> Pa 20°C

**MANGANESE SULPHATE****Evaporation rate**

Scientifically unjustified.

**Viscosity**

Technically not feasible.

**Solubility Value (G/100G  
H<sub>2</sub>O@20°C)** 450**Decomposition temperature (°C)**

No information available.

**Flash point (°C)**

Scientifically unjustified.

Not Applicable - Inorganic chemical.

**Auto Ignition Temperature (°C)**

Scientifically unjustified.

This product is not flammable.

**Partition Coefficient****(N-Octanol/Water)**

Scientifically unjustified.

Not Applicable - Inorganic chemical.

**Oxidising properties**

Does not meet the criteria for oxidising.

**9.2. Other information****Mol. Weight** 151**SECTION 10: STABILITY AND REACTIVITY****10.1. Reactivity**

There are no known reactivity hazards associated with this product.

**10.2. Chemical stability**

Stable under the prescribed storage conditions.

**10.3. Possibility of hazardous reactions**

Not known.

**10.4. Conditions to avoid**

Water, moisture. Toxic gases are generated when heated.

**10.5. Incompatible materials****Materials To Avoid**

Strong acids. Strong oxidising substances. Powdered metal. Inorganic peroxides.

**10.6. Hazardous decomposition products**Sulphurous gases (SO<sub>x</sub>). Oxides of: Manganese.**SECTION 11: TOXICOLOGICAL INFORMATION****11.1. Information on toxicological effects****Acute toxicity:****Acute Toxicity (Oral LD50)**

2150 mg/kg Rat

Test method(s): Indian Journal of Pharmacology, 23(3): 153-159. REACH dossier information

Based on available data the classification criteria are not met.

**Acute Toxicity (Dermal LD50)**

Not determined.

Dermal absorption is unlikely due to the physical-chemical properties of the substance.

**Acute Toxicity (Inhalation LC50)**

&gt; 4.45 mg/l (dust/mist) Rat 4 hours

Test method(s): OECD 403.

Based on available data the classification criteria are not met.

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### Skin Corrosion/Irritation:

#### **Erythema/Eschar score**

No erythema (0).

#### **Oedema score**

No oedema (0).

Test method(s): OECD 404.

Not irritating.

### Serious eye damage/irritation:

Irritating. Test method(s): OECD 405. Irritation score: 36 / 110

### Respiratory or skin sensitisation:

#### **Skin sensitisation**

Patch Test: Mouse

Not Sensitising.

REACH dossier information

### Germ cell mutagenicity:

#### **Genotoxicity - In Vitro**

Gene Mutation:

REACH dossier information - A surrogate substance (Manganese chloride) was used. Test method(s): OECD 476. + 471.

Negative.

#### **Genotoxicity - In Vivo**

Chromosome aberration:

REACH dossier information - A surrogate substance (Manganese chloride) was used. Test method(s): OECD 474.

Negative.

### Carcinogenicity:

#### **Carcinogenicity**

NOAEL (σ) 615 mg/kg Oral Rat

NOAEL (♀) 715 mg/kg Oral Rat

REACH dossier information - Test method(s): 70 male and 70 female rats were fed diets containing 0, 1, 500, 5,000, or 15,000 ppm manganese (II) sulphate monohydrate for 103 weeks. The level of manganese in the diet received by controls was approximately 92 ppm. As many as 10 rats per group were evaluated after 9 months and 15 months of chemical exposure.

Based on available data the classification criteria are not met.

### Reproductive Toxicity:

#### **Reproductive Toxicity - Fertility**

Endpoint waived according to REACH Annex VII, IX or XI.

Testing waived because a more severe health effect was found (STOT-RE class2). Controlling the risk of 'STOT-RE class 2' will control the risks for this endpoint.

Suspected reproductive toxicant based on limited evidence.

#### **Reproductive Toxicity - Development**

Endpoint waived according to REACH Annex VII, IX or XI.

Testing waived because a more severe health effect was found (STOT-RE class2). Controlling the risk of 'STOT-RE class 2' will control the risks for this endpoint.

Suspected reproductive toxicant based on limited evidence.

### Specific target organ toxicity - single exposure:

#### **STOT - Single exposure**

Scientifically unjustified.

### Specific target organ toxicity - repeated exposure:

#### **STOT - Repeated exposure**

Not determined.

#### **Target Organs**

Brain

MnSO<sub>4</sub> is already classified under Directive 67/548/EEC as R48/20/22 and under GHS as STOT RE2. Data exists showing some neurochemical changes at low levels after inhalation exposure for 90-days, together with locomotor changes, around 3 mg/m<sup>3</sup> concentration, suggesting that significant toxicity could occur at the 20-200 mg/m<sup>3</sup> concentration level, which supports the current classification of STOT RE 2 for the inhalation route.

### Aspiration hazard:

## MANGANESE SULPHATE

### Viscosity

Not applicable.

### Inhalation

Prolonged inhalation of high concentrations may damage respiratory system.

### Ingestion

May cause discomfort if swallowed.

### Skin contact

Powder may irritate skin.

### Eye contact

Particles in the eyes may cause irritation and smarting.

### Route of entry

Inhalation.

### Target Organs

Brain Eyes Respiratory system, lungs Skin

## SECTION 12: ECOLOGICAL INFORMATION

### Ecotoxicity

Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

#### 12.1. Toxicity

##### Acute Toxicity - Fish

LC50 96 hours 14.5 mg/l *Onchorhynchus mykiss* (Rainbow trout)

REACH dossier information

##### Acute Toxicity - Aquatic Invertebrates

EC50 48 hours 9.8 mg/l *Daphnia magna*

A surrogate substance (Manganese chloride) was used. The units are expressed in 'mg/µg' of: Manganese. REACH dossier information

##### Acute Toxicity - Aquatic Plants

EC50 72 hours 61 mg/l

*Desmodesmus subspicatus* (algae). Test method(s): OECD 201. REACH dossier information

##### Chronic Toxicity - Aquatic Invertebrates

Not applicable.

A variety of tests have indicated that a classification more severe than Aquatic Chronic 2 is not required (CSR 2010). REACH dossier information

#### 12.2. Persistence and degradability

##### Degradability

The product contains persistent (not readily degradable) substances.

##### Phototransformation

Not applicable.

##### Stability (Hydrolysis)

Not applicable.

##### Biodegradation

Not Applicable - Inorganic chemical.

#### 12.3. Bioaccumulative potential

##### Bioaccumulative potential

Bioaccumulation of this product is not expected to occur.

##### Partition coefficient

Scientifically unjustified.

Not Applicable - Inorganic chemical.

#### 12.4. Mobility in soil

##### Mobility:

An adsorption / desorption study on Manganese (2+) has been conducted in 35 soils following the OECD sorption guideline. Data for 100 day incubations show that, as expected, the sorption is pH sensitive. A median Kd value of 1355 ml/g has been determined for all soils (pH range 3.0-8.5).

**MANGANESE SULPHATE****12.5. Results of PBT and vPvB assessment**

This product does not contain any PBT or vPvB substances.

**12.6. Other adverse effects**

None known.

**SECTION 13: DISPOSAL CONSIDERATIONS****13.1. Waste treatment methods**

Dispose of waste and residues in accordance with local authority requirements. Residues and empty containers should be taken care of as hazardous waste according to local and national provisions.

**SECTION 14: TRANSPORT INFORMATION****14.1. UN number**

UN No. (ADR/RID/ADN)	3077
UN No. (IMDG)	3077
UN No. (ICAO)	3077

**14.2. UN proper shipping name**

Proper Shipping Name	UN 3077 ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Manganese Sulphate) 9, III, (E)
Proper Shipping Name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.

**14.3. Transport hazard class(es)**

ADR/RID/ADN Class	Class 9: Miscellaneous dangerous substances and articles.
ADR Label No.	9
IMDG Class	9
ICAO Class/Division	9
Transport Labels	

**14.4. Packing group**

IMDG Packing group	III
ICAO Packing group	III

**14.5. Environmental hazards**

Environmentally Hazardous Substance/Marine Pollutant

**14.6. Special precautions for user**

EMS	F-A, S-F
Emergency Action Code	2Z



**MANGANESE SULPHATE**

**Hazard No. (ADR)** 90  
**Tunnel Restriction Code** (E)

**14.7. Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**

Not applicable.

**SECTION 15: REGULATORY INFORMATION****15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture****Guidance Notes**

Workplace Exposure Limits EH40.

**EU Legislation**

Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC, including amendments. Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006 with amendments.

**15.2. Chemical Safety Assessment**

A chemical safety assessment has been carried out.

**SECTION 16: OTHER INFORMATION****General information**

The following information is provided to conform with article 13 of the EC Directive on Packaging and Packaging Waste 94/62/EC:

- Wherever possible we use returnable packaging and pallets. Details of these are on our Sales Contracts
- For any non-returnable packaging the cost of disposal is at your expense, but we do have a list of reprocessors available
- In most cases, but not all, we are able to supply products in returnable packaging but the additional cost of this will be for the customer's expense. Please ask for details with your specific requirements
- Any products supplied in returnable packaging is clearly marked to this effect.

**Revision Date** 08/04/2014**Revision** 4**Supersedes date** 06/09/2011**Safety Data Sheet Status** For further information see attached Exposure Scenario.**Risk Phrases In Full**

R48/20/22 Harmful: danger of serious damage to health by prolonged exposure through inhalation and if swallowed.

R51/53 Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

**Hazard Statements In Full**

H318 Causes serious eye damage.

H373 May cause damage to organs &lt;&lt;Organs&gt;&gt; through prolonged or repeated exposure if inhaled.

H411 Toxic to aquatic life with long lasting effects.

**Disclaimer**

This information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process. Such information is, to the best of the company's knowledge and belief, accurate and reliable as of the date indicated. However, no warranty guarantee or representation is made to its accuracy, reliability or completeness. It is the user's responsibility to satisfy himself as to the suitability of such information for his own particular use.