

Section 1: Identification of the substance/mixture and of the company/undertaking

Product identifier

Name of the substance	Manganese dioxide
Trade name of the substance	TRONOX® Manganese Dioxide
Identification Number	025-001-00-3
Registration number	-
Synonyms	Manganese oxide (MnO ₂)
SDS number	B-5019
Product code	Manganese dioxide
Date of first issue	26-January-2011
Version number	01
Revision date	-
Supersedes date	-

Relevant identified uses of the substance or mixture and uses advised against

Identified uses	Manufacture of alkaline batteries.
Uses advised against	None known.

Details of the supplier of the safety data sheet

Company name	Tronox Pigments (Holland) BV Prof. Gerbrandyweg 2 3197KK Rotterdam-Botlek The Netherlands ChemProdSteward@tronox.com
Telephone	+31 181 246600
Emergency	CHEMTREC 1-760-476-3961 (Access code: 333318)

Section 2: Hazards identification

Classification of the substance or mixture

The substance has been assessed and/or tested for its physical, health and environmental hazards and the following classification applies.

Classification according to Directive 67/548/EEC or 1999/45/EC as amended

Classification Xn;R20/22-48/20/22

Classification according to Regulation (EC) No 1272/2008 as amended

Health hazards

Acute toxicity, oral	Category 4	Harmful if swallowed.
Acute toxicity, inhalation	Category 4	Harmful if inhaled.
Specific target organ toxicity - repeated exposure (inhalation)	Category 2 (brain)	May cause damage to organs (brain) through prolonged or repeated exposure by inhalation.

Hazard summary

Physical hazards	Not classified for physical hazards.
Health hazards	Harmful: danger of serious damage to health by prolonged exposure through inhalation and if swallowed. Harmful by inhalation and if swallowed. Occupational exposure to the substance or mixture may cause adverse health effects.
Environmental hazards	Not classified for hazards to the environment.
Specific hazards	Dusts may irritate the respiratory tract, skin and eyes. Inhalation of manganese oxide dust/fumes may cause metal fume fever. The symptoms are shivering, fever, malaise and muscular pain. Chronic exposure to breathing low levels of manganese dust or fume over a long period of time can result in "manganism," a disease of the central nervous system similar to Parkinson's Disease, gait impairment, muscle spasms and behavioral changes. Frequent inhalation of dust over a long period of time increases the risk of developing lung diseases. Frequent or prolonged contact may defat and dry the skin, leading to discomfort and dermatitis. Not itself combustible but assists fire in burning materials.
Main symptoms	Coughing. May cause irritation through mechanical abrasion.

Label elements

Label according to Regulation (EC) No. 1272/2008 as amended

Contains: Manganese dioxide

Identification Number 025-001-00-3



Signal word Warning

Hazard statements Harmful if swallowed. Harmful if inhaled. May cause damage to organs (brain) through prolonged or repeated exposure by inhalation.

Precautionary statements

Prevention Wash thoroughly after handling. Do not eat, drink or smoke when using this product. Do not breathe dust. Use only outdoors or in a well-ventilated area.

Response IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell. Rinse mouth. IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or doctor/physician if you feel unwell.

Storage Store away from incompatible materials.

Disposal Dispose of contents/container in accordance with local/regional/national/international regulations.

Supplemental label information Not applicable.

Other hazards None known.

Section 3: Composition/information on ingredients

Substance

General information

Chemical name	%	CAS-No. / EC No.	REACH Registration No.	INDEX No.	Notes
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Manganese dioxide	92	1313-13-9 215-202-6	-	025-001-00-3	#
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Classification: **DSD:** Xn;R20/22-48/20/22

CLP: Acute Tox. 4;H302, Acute Tox. 4;H332, STOT RE 2;H373

DSD: Directive 67/548/EEC.

CLP: Regulation No. 1272/2008.

#: This substance has workplace exposure limit(s).

Composition comments The full text for all R- and H-phrases is displayed in section 16.

Section 4: First aid measures

General information Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

Description of first aid measures

Inhalation Move to fresh air. Get medical attention if any discomfort continues.

Skin contact Flush skin thoroughly with water. Get medical attention if irritation develops and persists.

Eye contact Dust in the eyes: Do not rub eyes. Remove contact lenses, if present and easy to do. Rinse with water. Get medical attention if irritation develops or persists.

Ingestion Do not induce vomiting without advice from poison control centre. Never give anything by mouth to an unconscious person. If ingestion of a large amount does occur, call a poison control centre immediately.

Most important symptoms and effects, both acute and delayed Coughing. May cause irritation through mechanical abrasion.

Indication of any immediate medical attention and special treatment needed Treat symptomatically.

Section 5: Firefighting measures

General fire hazards Not itself combustible but assists fire in burning materials. The substance decomposes on heating above 535 °C producing manganese(III)oxide and oxygen, which increases fire hazard.

Extinguishing media

Suitable extinguishing media Use fire-extinguishing media appropriate for surrounding materials.

Unsuitable extinguishing media	None.
Special hazards arising from the substance or mixture	The substance decomposes on heating above 535 °C producing manganese(III)oxide and oxygen.
Advice for firefighters	
Special protective equipment for firefighters	Firefighters should wear full protective clothing including self contained breathing apparatus. Selection of respiratory protection for fire fighting: follow the general fire precautions indicated in the workplace.
Special firefighting procedures	Move containers from fire area if you can do so without risk.

Section 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel	Avoid inhalation of dust and contact with skin and eyes. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Use Personal Protective Equipment recommended in Section 8 of the SDS.
For emergency responders	Keep unnecessary personnel away. Use personal protection recommended in Section 8 of the SDS.

Environmental precautions Prevent further leakage or spillage if safe to do so.

Methods and material for containment and cleaning up Collect powder using special dust vacuum cleaner with particle filter or carefully sweep into closed container. For waste disposal, see Section 13.

Reference to other sections See Section 8 for personal protective equipment. For waste disposal, see Section 13.

Section 7: Handling and storage

Precautions for safe handling Avoid inhalation of dust and contact with skin and eyes. Use only with adequate ventilation. Use Personal Protective Equipment recommended in section 8 of the MSDS. Wash thoroughly after handling.

Conditions for safe storage, including any incompatibilities Store in tightly closed original container in a dry and cool place. Store away from incompatible materials.

Specific end use(s) Manufacture of alkaline batteries.

Section 8: Exposure controls/personal protection

Control parameters

Occupational exposure limits

UK. EH40 Workplace Exposure Limits (WELs)

Material	Type	Value
Manganese dioxide (1313-13-9)	TWA	0.5 mg/m ³

Biological limit values No biological exposure limits noted for the ingredient(s).

Recommended monitoring procedures Follow standard monitoring procedures.

DNEL Not available.

PNEC Not available.

Exposure controls

Appropriate engineering controls Ventilate as needed to control airborne dust. Provide adequate ventilation. Observe Occupational Exposure Limits and minimise the risk of inhalation of dust.

Individual protection measures, such as personal protective equipment

General information Personal protective equipment should be chosen according to the CEN standards and in discussion with the supplier of the personal protective equipment.

Eye/face protection Wear dust-resistant safety goggles where there is danger of eye contact.

Skin protection

- Hand protection Wear protective gloves.

- Other Wear suitable protective clothing. Wear suitable gloves.

Respiratory protection In case of inadequate ventilation or risk of inhalation of dust, use suitable respiratory equipment with particle filter (type P2). Seek advice from local supervisor.

Thermal hazards Wear appropriate thermal protective clothing, when necessary.

Hygiene measures Do not breathe dust. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

Environmental exposure controls Contain spills and prevent releases and observe national regulations on emissions.

Section 9: Physical and chemical properties

Information on basic physical and chemical properties

Appearance	Powder.
Physical state	Solid.
Form	Powder.
Colour	Black.
Odour	Odourless.
Odour threshold	Not available.
pH	Not applicable.
Melting point/freezing point	Decomposes
Boiling point, initial boiling point, and boiling range	Not available.
Flash point	Not applicable.
Auto-ignition temperature	Not applicable.
Flammability (solid, gas)	Not available.
Flammability limit - lower (%)	Not available.
Flammability limit - upper (%)	Not available.
Oxidising properties	Not applicable.
Explosive properties	Not applicable.
Explosive limit	Not applicable.
Vapour pressure	Not applicable.
Vapour density	Not applicable.
Evaporation rate	Not applicable.
Relative density	Not available.
Solubility (water)	Not available.
Partition coefficient (n-octanol/water)	Not available.
Decomposition temperature	535 °C (995 °F)
Bulk density	86 lb/ft ³
Viscosity	Not available.
Percent volatile	Not available.
Other data	
Molecular formula	MnO ₂
Other information	No relevant additional information available.

Section 10: Stability and reactivity

Reactivity	Not available.
Chemical stability	Stable under normal temperature conditions.
Possibility of hazardous reactions	Hazardous polymerisation does not occur.
Conditions to avoid	Avoid incompatible materials and intense heat. When subjected to intense heat, temperature above 535°C, it will release oxygen which would increase the intensity of a fire.
Incompatible materials	Organic material. Combustible material. Reducing Agents. Aluminium. Azides. Chlorates. Oxidizing agents. Phosphides. Strong acids. Halogens. Sulfur.
Hazardous decomposition products	The substance decomposes on heating above 535 °C producing manganese(III)oxide and oxygen.

Section 11: Toxicological information

General information	Inhalation of manganese oxide dust/fumes may cause metal fume fever. The symptoms are shivering, fever, malaise and muscular pain.
Information on likely routes of exposure	
Ingestion	Harmful if swallowed.
Inhalation	Harmful by inhalation. Dust may irritate respiratory system.

Skin contact	Dust may irritate skin.
Eye contact	Dust may irritate the eyes.
Symptoms	Dusts or powder may irritate the respiratory tract, skin and eyes. Coughing.

Information on toxicological effects

Acute toxicity Harmful if inhaled or swallowed.

Product

Test results

Manganese dioxide (1313-13-9)

Acute Oral LD50 Rat: >= 3478 mg/kg

Skin corrosion/irritation Dust may irritate skin.

Serious eye damage/eye irritation Dust may irritate the eyes.

Respiratory sensitisation No data available.

Skin sensitisation Not a skin sensitiser.

Germ cell mutagenicity Knowledge about mutagenicity is incomplete.

Carcinogenicity No data available.

Reproductive toxicity Knowledge about reproductive effects is incomplete.

Specific target organ toxicity - single exposure None known.

Specific target organ toxicity - repeated exposure May cause damage to organs through prolonged or repeated exposure: Brain.

Aspiration hazard Not classified.

Mixture versus substance information Not available.

Other information Chronic exposure to breathing low levels of manganese dust or fume over a long period of time can result in "manganism," a disease of the central nervous system similar to Parkinson's Disease, gait impairment, muscle spasms and behavioral changes. Frequent inhalation of dust over a long period of time increases the risk of developing asthma, chronic lung diseases, and skin irritation.

Section 12: Ecological information

Toxicity No toxicity data noted for the ingredient(s).

Persistence and degradability The degradability of the product has not been stated.

Bioaccumulative potential No data available on bioaccumulation.

Mobility The product is insoluble in water and will sediment in water systems.

Environmental fate - Partition coefficient Not available.

Mobility in soil Not available.

Results of PBT and vPvB assessment Not available.

Other adverse effects The product is not expected to be hazardous to the environment.

Section 13: Disposal considerations

Waste treatment methods

Residual waste Dispose of in accordance with local regulations.

Contaminated packaging Since emptied containers may retain product residue, follow label warnings even after container is emptied.

EU waste code 16 05 07*

Waste codes should be assigned by the user based on the application for which the product was used.

Disposal methods/information Dispose of this material and its container to hazardous or special waste collection point. Do not allow this material to drain into sewers/water supplies.

Section 14: Transport information

ADR

The product is not covered by international regulation on the transport of dangerous goods.

RID

The product is not covered by international regulation on the transport of dangerous goods.

ADN

The product is not covered by international regulation on the transport of dangerous goods.

IATA

The product is not covered by international regulation on the transport of dangerous goods.

IMDG

The product is not covered by international regulation on the transport of dangerous goods.

Transport in bulk according to Not applicable.

**Annex II of MARPOL73/78 and
the IBC Code**

Section 15: Regulatory information

Safety, health and environmental regulations/legislation specific for the substance or mixture

EU Regulations

Regulation (EC) No. 2037/2000 on substances that deplete the ozone layer, Annex I

Not listed.

Regulation (EC) No. 2037/2000 on substances that deplete the ozone layer, Annex II

Not listed.

Regulation (EC) No. 850/2004 on persistent organic pollutants, Annex I

Not listed.

Regulation (EC) No. 689/2008 concerning the export and import of dangerous chemicals, Annex I, part 1

Not listed.

Regulation (EC) No. 689/2008 concerning the export and import of dangerous chemicals, Annex I, part 2

Not listed.

Regulation (EC) No. 689/2008 concerning the export and import of dangerous chemicals, Annex I, part 3

Not listed.

Regulation (EC) No. 689/2008 concerning the export and import of dangerous chemicals, Annex V

Not listed.

**Directive 96/61/EC concerning integrated pollution prevention and control (IPPC): Article 15, European Pollution
Emission Registry (EPER)**

Not listed.

Regulation (EC) No. 1907/2006, REACH Article 59(1). Candidate List

Not listed.

Other regulations

The product is classified and labelled in accordance with Regulation (EC) 1272/2008 (CLP Regulation) as amended and respective national laws implementing EC directives.

National regulations

Not available.

Chemical safety assessment

No Chemical Safety Assessment has been carried out.

Section 16: Other information

List of abbreviations

DNEL: Derived No-Effect Level.
PNEC: Predicted No-Effect Concentration.
PBT: Persistent, bioaccumulative and toxic.
vPvB: Very Persistent and very Bioaccumulative.

References

Not available.

Information on evaluation method leading to the classification of mixture

Not available.

Full text of any statements or R-phrases and H-phrases under Sections 2 to 15

R20/22 Harmful by inhalation and if swallowed.
R48/20/22 Harmful: danger of serious damage to health by prolonged exposure through inhalation and if swallowed.
H302 - Harmful if swallowed.
H332 - Harmful if inhaled.
H373 - May cause damage to organs through prolonged or repeated exposure by skin contact.

Training information

Follow training instructions when handling this material.

Disclaimer

The information in the sheet was written based on the best knowledge and experience currently available.

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