



SAFETY DATA SHEET

DOW AGROSCIENCES SOUTHERN AFRICA PTY LTD

Product name: DITHANE M-45™ 800 WP NT

Issue Date: 08.09.2017

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DOW AGROSCIENCES SOUTHERN AFRICA PTY LTD encourages and expects you to read and understand the entire (M)SDS, as there is important information throughout the document. We expect you to follow the precautions identified in this document unless your use conditions would necessitate other appropriate methods or actions.

1. PRODUCT AND COMPANY IDENTIFICATION

Product name: DITHANE M-45™ 800 WP NT

Recommended use of the chemical and restrictions on use

Identified uses: Plant Protection Product Fungicide

COMPANY IDENTIFICATION

DOW AGROSCIENCES SOUTHERN AFRICA PTY LTD
GROUND FLOOR MAGWA BUILDING
MAXWELL OFFICE PARK MAGWA CRESCENT
MIDRAND
1686
SOUTH AFRICA

Customer Information Number:

SDS@corteva.com

EMERGENCY TELEPHONE NUMBER Local Emergency number :
+27 82 895 0621 (SA only) 24hr Emergency number : +32 3 575 55
55

2. HAZARDS IDENTIFICATION

Classification of the substance or mixture

Skin sensitisation - Category 1 - H317

Reproductive toxicity - Category 2 - H361d

Acute aquatic toxicity - Category 1 - H400

For the full text of the H-Statements mentioned in this Section, see Section 16.

Label elements

Hazard pictograms

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Signal word: WARNING

Hazard statements

- H317 May cause an allergic skin reaction.
- H361d Suspected of damaging the unborn child.
- H400 Very toxic to aquatic life.

Precautionary statements

- P280 Wear protective gloves/ protective clothing.
- P273 Avoid release to the environment.
- P302 + P352 IF ON SKIN: Wash with plenty of water.
- P308 + P313 IF exposed or concerned: Get medical advice/ attention.
- P501 Dispose of contents/container in accordance with applicable regulations.

Supplemental information

- EUH401 To avoid risks to human health and the environment, comply with the instructions for use.

Contains Mancozeb

Other hazards

No data available

3. COMPOSITION/INFORMATION ON INGREDIENTS

This product is a mixture.

CASRN / EC-No. / Index-No.	Concentration	Component	Classification
CASRN 8018-01-7 ECNo. 616-995-5 IndexNo. 006-076-00-1	80,0%	Mancozeb	Skin Sens. - 1 - H317 Repr. - 2 - H361d Aquatic Acute - 1 - H400
CASRN 100-97-0 ECNo. 202-905-8 IndexNo. 612-101-00-2	>= 1,0 - < 3,0 %	Hexamethylenetetramine	Flam. Sol. - 2 - H228 Skin Sens. - 1 - H317

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

Description of first aid measures

General advice: First Aid responders should pay attention to self-protection and use the recommended protective clothing (chemical resistant gloves, splash protection). If potential for exposure exists refer to Section 8 for specific personal protective equipment.

Inhalation: Move person to fresh air. If person is not breathing, call an emergency responder or ambulance, then give artificial respiration; if by mouth to mouth use rescuer protection (pocket mask etc). Call a poison control center or doctor for treatment advice.

Skin contact: Take off contaminated clothing. Wash skin with soap and plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice. Wash clothing before reuse. Shoes and other leather items which cannot be decontaminated should be disposed of properly.

Eye contact: Hold eyes open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eyes. Call a poison control center or doctor for treatment advice. Suitable emergency eye wash facility should be available in work area.

Ingestion: No emergency medical treatment necessary.

Most important symptoms and effects, both acute and delayed: Aside from the information found under Description of first aid measures (above) and Indication of immediate medical attention and special treatment needed (below), any additional important symptoms and effects are described in Section 11: Toxicology Information.

Indication of any immediate medical attention and special treatment needed Notes to physician: May cause asthma-like (reactive airways) symptoms. Bronchodilators, expectorants, antitussives and corticosteroids may be of help. No specific antidote. Treatment of exposure should

be directed at the control of symptoms and the clinical condition of the patient. Have the Safety Data Sheet, and if available, the product container or label with you when calling a poison control center or doctor, or going for treatment. Repeated excessive exposure may aggravate preexisting lung disease.

5. FIREFIGHTING MEASURES

Suitable extinguishing media: Water. Dry chemical fire extinguishers. Carbon dioxide fire extinguishers.

Unsuitable extinguishing media: Foam

Special hazards arising from the substance or mixture

Hazardous combustion products: During a fire, smoke may contain the original material in addition to combustion products of varying composition which may be toxic and/or irritating. Combustion products may include and are not limited to: Sulfur oxides. Nitrogen oxides. Hydrogen sulfide. Carbon monoxide. Carbon dioxide.

Unusual Fire and Explosion Hazards: Do not permit dust to accumulate. When suspended in air dust can pose an explosion hazard. Minimize ignition sources. If dust layers are exposed to elevated temperatures, spontaneous combustion may occur.

Advice for firefighters

Fire Fighting Procedures: Keep people away. Isolate fire and deny unnecessary entry. Consider feasibility of a controlled burn to minimize environment damage. Soak thoroughly with water to cool and prevent re-ignition. Use water spray to cool fire exposed containers and fire affected zone until fire is out and danger of reignition has passed. Hand held dry chemical or carbon dioxide extinguishers may be used for small fires. Dust explosion hazard may result from forceful application of fire extinguishing agents. Contain fire water run-off if possible. Fire water run-off, if not contained, may cause environmental damage. Review the "Accidental Release Measures" and the "Ecological Information" sections of this (M)SDS.

Special protective equipment for firefighters: Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots, and gloves). Avoid contact with this material during fire fighting operations. If contact is likely, change to full chemical resistant fire fighting clothing with self-contained breathing apparatus. If this is not available, wear full chemical resistant clothing with self-contained breathing apparatus and fight fire from a remote location. For protective equipment in post-fire or non-fire clean-up situations, refer to the relevant sections.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures: Isolate area. Keep unnecessary and unprotected personnel from entering the area. Refer to section 7, Handling, for additional precautionary measures. Keep upwind of spill. Spilled material may cause a slipping

hazard. Ventilate area of leak or spill. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.

Environmental precautions: Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information. Spills or discharge to natural waterways is likely to kill aquatic organisms.

Methods and materials for containment and cleaning up: Contain spilled material if possible. Small spills: Sweep up. Collect in suitable and properly labeled containers. Large spills: Contact Dow AgroSciences for clean-up assistance. See Section 13, Disposal Considerations, for additional information.

7. HANDLING AND STORAGE

Precautions for safe handling: Keep away from heat, sparks and flame. Keep out of reach of children. Do not swallow. Avoid breathing dust or mist. Avoid contact with eyes, skin, and clothing. Avoid prolonged or repeated contact with skin. Wash thoroughly after handling. Keep container closed. Use with adequate ventilation. Good housekeeping and controlling of dusts are necessary for safe handling of product. See Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION.

Conditions for safe storage: Avoid moisture. Store in a dry place. Store in original container. Do not store near food, foodstuffs, drugs or potable water supplies.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure limits are listed below, if they exist.

Component	Regulation	Type of listing	Value/Notation
Mancozeb	US WEEL	TWA Total	1 mg/m ³
	US WEEL	TWA	Skin Sensitizer
	ZA OEL	TWA OEL-RL	5 mg/m ³ , Manganese
Hexamethylenetetramine	Dow IHG	TWA	10 mg/m ³

RECOMMENDATIONS IN THIS SECTION ARE FOR MANUFACTURING, COMMERCIAL BLENDING AND PACKAGING WORKERS. APPLICATORS AND HANDLERS SHOULD SEE THE PRODUCT LABEL FOR PROPER PERSONAL PROTECTIVE EQUIPMENT AND CLOTHING.

Exposure controls

Engineering controls: Use engineering controls to maintain airborne level below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, use only with adequate ventilation. Local exhaust ventilation may be necessary for some operations.

Individual protection measures

Eye/face protection: Use chemical goggles. Chemical goggles should be consistent with EN 166 or equivalent.

Skin protection

Hand protection: Use chemical resistant gloves classified under Standard EN374: Protective gloves against chemicals and micro-organisms. Examples of preferred glove barrier materials include: Polyvinyl chloride ("PVC" or "vinyl"). Neoprene. Nitrile/butadiene rubber ("nitrile" or "NBR"). When prolonged or frequently repeated contact may occur, a glove is recommended to prevent contact with the solid material. Glove thickness alone is not a good indicator of the level of protection a glove provides against a chemical substance as this level of protection is also highly dependent on the specific composition of the material that the glove is fabricated from. The thickness of the glove must, depending on model and type of material, generally be more than 0.35 mm to offer sufficient protection for prolonged and frequent contact with the substance. As an exception to this general rule it is known that multilayer laminate gloves may offer prolonged protection at thicknesses less than 0.35 mm. Other glove materials with a thickness of less than 0.35 mm may offer sufficient protection when only brief contact is expected. **NOTICE:** The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.

Other protection: Use protective clothing chemically resistant to this material.

Selection of specific items such as face shield, boots, apron, or full body suit will depend on the task.

Respiratory protection: Respiratory protection should be worn when there is a potential to exceed the exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, use an approved respirator. Selection of air-purifying or positive-pressure supplied-air will depend on the specific operation and the potential airborne concentration of the material. For emergency conditions, use an approved positive-pressure self-contained breathing apparatus.

Use the following CE approved air-purifying respirator: Organic vapor cartridge with a particulate pre-filter, type AP2.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	Physical state	Powder
Color		Yellow
Odor		Sulfur-like
Odor Threshold		No test data available
pH		Not applicable
Melting point/range		Not Applicable--Decomposes

Freezing point	Not applicable	Boiling point (760 mmHg)	Not applicable
Flash point	closed	Evaporation Rate (Butyl Acetate cup 146 °C)	Not applicable = 1)
Flammability (solid, gas)	Not expected to form explosive dust-air mixtures.		
Lower explosion limit	Not applicable		
Upper explosion limit	Not applicable		
Vapor Pressure	Negligible		
Relative Vapor Density (air = 1)	Not applicable		
Relative Density (water = 1)	No test data available		
Water solubility	No test data available		
Partition coefficient: noctanol/water	No data available		
Auto-ignition temperature	Not applicable		
Decomposition temperature	192 - 204 °C		
Kinematic Viscosity	Not applicable		
Explosive properties	No		
Oxidizing properties	No		
Bulk density	0,35 - 0,50 kg/L		
Molecular weight	No data available		

NOTE: The physical data presented above are typical values and should not be construed as a specification.

10. STABILITY AND REACTIVITY

Reactivity: No dangerous reaction known under conditions of normal use.

Chemical stability: Thermally stable at typical use temperatures.

Possibility of hazardous reactions: Polymerization will not occur.

Conditions to avoid: Product decomposes above melting temperature. Generation of gas during decomposition can cause pressure in closed systems. Avoid moisture.

Incompatible materials: Avoid contact with: Acids. Moisture. Oxidizers.

Hazardous decomposition products: Decomposition products depend upon temperature, air supply and the presence of other materials. Decomposition products can include and are not limited to: Carbon monoxide. Carbon dioxide. Hydrogen sulfide. Nitrogen oxides. Sulfur oxides. Toxic gases are released during decomposition.

11. TOXICOLOGICAL INFORMATION

Toxicological information appears in this section when such data is available.

Acute toxicity Acute oral toxicity

Very low toxicity if swallowed. Harmful effects not anticipated from swallowing small amounts.

As product:

LD50, Rat, > 5 000 mg/kg

Acute dermal toxicity

Prolonged skin contact is unlikely to result in absorption of harmful amounts.

As product:

LD50, Rat, > 5 000 mg/kg

Acute inhalation toxicity

Dust may cause irritation of the upper respiratory tract (nose and throat) and lungs. Prolonged excessive exposure to dust may cause adverse effects.

As product: The LC50 has not been determined.

For the active ingredient(s):

LC50, Rat, 4 Hour, Dust, > 5,14 mg/l

Skin corrosion/irritation

Prolonged contact may cause slight skin irritation with local redness.

Serious eye damage/eye irritation May

cause moderate eye irritation.

Corneal injury is unlikely.

Sensitization

For the active ingredient(s):

Has caused allergic skin reactions when tested in guinea pigs.

For the minor component(s):

Has caused allergic skin reactions in humans.

For respiratory sensitization:

No relevant data found.

Specific Target Organ Systemic Toxicity (Single Exposure)

Available data are inadequate to determine single exposure specific target organ toxicity.

Specific Target Organ Systemic Toxicity (Repeated Exposure)

For the active ingredient(s):

In animals, effects have been reported on the following organs: Thyroid.

Liver.

Carcinogenicity

For the active ingredient(s): Has caused cancer at high doses in laboratory rats.

Teratogenicity

For the active ingredient(s): Has caused birth defects in laboratory animals only at doses toxic to the mother. Has been toxic to the fetus in laboratory animals at doses toxic to the mother.

Reproductive toxicity

For the active ingredient(s): In animal studies, did not interfere with reproduction. In animal studies, did not interfere with fertility.

Mutagenicity

For the active ingredient(s): In vitro genetic toxicity studies were predominantly negative. Animal genetic toxicity studies were negative.

Aspiration Hazard

Based on physical properties, not likely to be an aspiration hazard.

12. ECOLOGICAL INFORMATION

Ecotoxicological information appears in this section when such data is available.

Toxicity

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Acute toxicity to fish

Material is very toxic to aquatic organisms (LC50/EC50/IC50 below 1 mg/L in the most sensitive species).

LC50, *Oncorhynchus mykiss* (rainbow trout), 96 Hour, 0,088 mg/l

Acute toxicity to aquatic invertebrates

EC50, *Daphnia magna* (Water flea), 48 Hour, 0,073 mg/l

Acute toxicity to algae/aquatic plants

EyC50, *Scenedesmus capricornutum* (fresh water algae), 120 Hour, 0,044 mg/l

Toxicity to Above Ground Organisms

Material is practically non-toxic to birds on an acute basis (LD50 > 2000 mg/kg).

Material is practically non-toxic to birds on a dietary basis (LC50 > 5000 ppm).

oral LD50, *Colinus virginianus* (Bobwhite quail), > 3200mg/kg bodyweight. oral

LD50, *Apis mellifera* (bees), 48 Hour, mortality, > 100µg/bee contact LD50, *Apis*

mellifera (bees), 48 Hour, mortality, > 100µg/bee **Toxicity to soil-dwelling**

organisms

LC50, *Eisenia fetida* (earthworms), 14 d, > 299 mg/kg

Hexamethylenetetramine Acute toxicity to fish

Material is not classified as dangerous to aquatic organisms (LC50/EC50/IC50/LL50/EL50 greater than 100 mg/L in most sensitive species).

LC50, Pimephales promelas (fathead minnow), flow-through test, 96 Hour, 49 800 mg/l, OECD Test Guideline 203

Acute toxicity to aquatic invertebrates

EC50, Daphnia magna (Water flea), static test, 48 Hour, 36 000 mg/l, OECD Test Guideline 202

Persistence and degradability

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Biodegradability: Degradation is expected in the soil environment within days to weeks. Based on stringent OECD test guidelines, this material cannot be considered as readily biodegradable; however, these results do not necessarily mean that the material is not biodegradable under environmental conditions.

Stability in Water (1/2-life)

Hydrolysis, half-life, 17 Hour, pH 7, Half-life Temperature 25 °C

Photodegradation

Test Type: Half-life (indirect photolysis)

Sensitization: OH radicals

Atmospheric half-life: 0,05 d

Method: Estimated.

Hexamethylenetetramine

Biodegradability: Material is readily biodegradable. Passes OECD test(s) for ready biodegradability.

10-day Window: Not applicable

Biodegradation: 54 - 97 % **Exposure time:** 28 d

Method: OECD Test Guideline 301C or Equivalent

Bioaccumulative potential

Bioaccumulation: No data available.

Mobility in soil

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Potential for mobility in soil is low (Koc between 500 and 2000).

Partition coefficient (Koc): 1000 Estimated.

Hexamethylenetetramine

Potential for mobility in soil is very high (Koc between 0 and 50).

Partition coefficient (Koc): < 1 Estimated.

Results of PBT and vPvB assessment

Mancozeb

This substance is not considered to be persistent, bioaccumulating and toxic (PBT). This substance is not considered to be very persistent and very bioaccumulating (vPvB).

Hexamethylenetetramine

This substance has not been assessed for persistence, bioaccumulation and toxicity (PBT).

Other adverse effects

Mancozeb

This substance is not on the Montreal Protocol list of substances that deplete the ozone layer.

Hexamethylenetetramine

This substance is not on the Montreal Protocol list of substances that deplete the ozone layer.

13. DISPOSAL CONSIDERATIONS

Disposal methods: If wastes and/or containers cannot be disposed of according to the product label directions, disposal of this material must be in accordance with your local or area regulatory authorities. This information presented below only applies to the material as supplied. The identification based on characteristic(s) or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations. If the material as supplied becomes a waste, follow all applicable regional, national and local laws.

14. TRANSPORT INFORMATION

Classification for ROAD and Rail transport:

Proper shipping name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.(Mancozeb)
UN number	UN 3077
Class	9
Packing group	III
Environmental hazards	Mancozeb

Classification for SEA transport (IMO-IMDG):

Proper shipping name ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID,
N.O.S.(Mancozeb)

UN number UN 3077 **Class** 9 **Packing group**

III **Marine pollutant** Mancozeb **Transport in bulk**

Consult IMO regulations before transporting ocean bulk
**according to Annex I or II of MARPOL 73/78 and the IBC or
IGC Code**

Classification for AIR transport (IATA/ICAO):

Proper shipping name Environmentally hazardous substance, solid,
n.o.s.(Mancozeb)

UN number UN 3077

Class 9

Packing group III

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Transportation classifications may vary by container volume and may be influenced by regional or country variations in regulations. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

15. REGULATORY INFORMATION

Dow IHG	Dow Industrial Hygiene Guideline
TWA	8-hr TWA

TWA OEL-RL	Long term occupational exposure limits - recommended limit
US WEEL	USA. Workplace Environmental Exposure Levels (WEEL)

Seveso III: Directive 2012/18/EU of the European Parliament and of the Council on the control of major-accident hazards involving dangerous substances.

Listed in Regulation: ENVIRONMENTAL HAZARDS

Number in Regulation: E1

100 t

200 t

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

- H228 Flammable solid.
- H317 May cause an allergic skin reaction.
- H361d Suspected of damaging the unborn child.
- H400 Very toxic to aquatic life.

Revision

Identification Number: 101193322 / A290 / Issue Date: 08.09.2017 / Version: 3.0

DAS Code: GF-998

Most recent revision(s) are noted by the bold, double bars in left-hand margin throughout this document.

Legend

ZA OEL	South Africa. Hazardous Chemical Substances Regulations, Occupational Exposure Limits
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Information Source and References

This SDS is prepared by Product Regulatory Services and Hazard Communications Groups from information supplied by internal references within our company.

DOW AGROSCIENCES SOUTHERN AFRICA PTY LTD urges each customer or recipient of this (M)SDS to study it carefully and consult appropriate expertise, as necessary or appropriate, to become aware of and understand the data contained in this (M)SDS and any hazards associated with the product. The information herein is provided in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ between various locations. It is the buyer's/user's responsibility to ensure that his activities comply with all federal, state, provincial or local laws. The information presented here pertains only to the product as shipped. Since conditions for use of the product are not under the control of the manufacturer, it is the buyer's/user's duty to determine the

conditions necessary for the safe use of this product. Due to the proliferation of sources for information such as manufacturer-specific (M)SDSs, we are not and cannot be responsible for (M)SDSs obtained from any source other than ourselves. If you have obtained an (M)SDS from another source or if you are not sure that the (M)SDS you have is current, please contact us for the most current version.