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1. PRODUCT AND COMPANY IDENTIFICATION

Product identifier

Trade name : Drewfloc™ 422 polymer
™ Trademark, Solenis or its subsidiaries or affiliates,
registered in various countries

Recommended use of the chemical and restrictions on use

Use of the Substance/Mixture : Flocculating agent

Details of the supplier of the safety data sheet Solenis Singapore Pte Ltd #07-01/02 Pantech 21 Singapore 128388 Singapore EHSProductSafetyTeam@solenis.com	Emergency telephone number 001 800-7653-6472 , or contact your local emergency telephone number at 995 Product Information +65 6775 5366
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2. HAZARDS IDENTIFICATION

GHS Classification

Not a hazardous substance or mixture.

GHS Label element

Not a hazardous substance or mixture.

Other hazards which do not result in classification

No information available.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Hazardous components

Chemical Name	CAS-No.	Classification	Concentration (%)
CITRIC ACID, MONOHYDRATE	5949-29-1		1,20

4. FIRST AID MEASURES

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- General advice : No hazards which require special first aid measures.
- If inhaled : If breathed in, move person into fresh air.
 If unconscious place in recovery position and seek medical advice.
 If symptoms persist, call a physician.
- In case of skin contact : First aid is not normally required. However, it is recommended that exposed areas be cleaned by washing with soap and water.
- In case of eye contact : Remove contact lenses.
 Protect unharmed eye.
- If swallowed : Do not give milk or alcoholic beverages.
 Never give anything by mouth to an unconscious person.
 If symptoms persist, call a physician.
- Most important symptoms and effects, both acute and delayed : Signs and symptoms of exposure to this material through breathing, swallowing, and/or passage of the material through the skin may include:
 stomach or intestinal upset (nausea, vomiting, diarrhea)
 irritation (nose, throat, airways)
 Headache
 Dizziness
- Notes to physician : No hazards which require special first aid measures.

5. FIREFIGHTING MEASURES

- Suitable extinguishing media : Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
 Water spray
 Foam
- Specific hazards during firefighting : Organic dusts at sufficient concentration can form explosive mixtures in air.
 Do not allow run-off from fire fighting to enter drains or water courses.
- Hazardous combustion products : carbon dioxide and carbon monoxide
 Nitrogen oxides (NOx)
 acid vapors
 Ammonia
- Specific extinguishing methods : Product is compatible with standard fire-fighting agents.
- Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.
- Special protective equipment : In the event of fire, wear self-contained breathing apparatus.

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for firefighters

6. ACCIDENTAL RELEASE MEASURES

- Personal precautions, protective equipment and emergency procedures : Avoid dust formation.
Avoid breathing dust.
Persons not wearing protective equipment should be excluded from area of spill until clean-up has been completed.
Comply with all applicable federal, state, and local regulations.
- Environmental precautions : Prevent product from entering drains.
Prevent further leakage or spillage if safe to do so.
If the product contaminates rivers and lakes or drains inform respective authorities.
- Methods and materials for containment and cleaning up : Pick up and arrange disposal without creating dust.
Keep in suitable, closed containers for disposal.


7. HANDLING AND STORAGE

- Advice on protection against fire and explosion : Take measures to prevent the build up of electrostatic charge.
Provide appropriate exhaust ventilation at places where dust is formed.
- Advice on safe handling : Avoid dust formation.
Smoking, eating and drinking should be prohibited in the application area.
For personal protection see section 8.
- Conditions for safe storage : Containers which are opened must be carefully resealed and kept upright to prevent leakage.
No smoking.
Electrical installations / working materials must comply with the technological safety standards.
- Materials to avoid : No materials to be especially mentioned.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

- Engineering measures** : Provide appropriate exhaust ventilation at places where dust is formed.
General room ventilation should be adequate for normal conditions of use. However, if unusual operating conditions exist, provide sufficient mechanical (general and/or local exhaust) ventilation to maintain exposure below exposure guidelines (if applicable) or below levels that cause known, suspected or apparent adverse effects.

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Personal protective equipment

- Respiratory protection : No personal respiratory protective equipment normally required.
- Eye protection : Safety glasses
- Skin and body protection : Wear as appropriate:
Safety shoes
- Hygiene measures : Avoid breathing dust.

9. PHYSICAL AND CHEMICAL PROPERTIES

- Appearance : powder
- Physical state : solid
- Colour : white, light yellow
- Odour : amine-like
- Odour Threshold : No data available
- pH : 4,5, Concentration: 10 g/l (20 °C)
- Melting point/freezing point : Not applicable
- Boiling point/boiling range : Not applicable
- Flash point : Not applicable
- Evaporation rate : No data available
- Flammability (solid, gas) : No data available
- Upper explosion limit : Not applicable
- Lower explosion limit : 30.000 mg/m3
No data available
- Vapour pressure : No data available
- Relative vapour density : No data available
- Relative density : No data available
- Density : ca. 0,72 g/cm3
- Bulk density : ca. 620 kg/m3

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Solubility(ies)
 Water solubility : soluble

Solubility in other solvents : No data available

Partition coefficient: n-
 octanol/water : No data available

Auto-ignition temperature : >
 400 °C

Thermal decomposition : No data available

Viscosity
 Viscosity, dynamic : No data available

Viscosity, kinematic : No data available

Oxidizing properties : No data available

10. STABILITY AND REACTIVITY

Reactivity : No decomposition if stored and applied as directed.

Chemical stability : Stable under recommended storage conditions.

Possibility of hazardous
 reactions : Product will not undergo hazardous polymerization.


Conditions to avoid : Keep away from heat, flame, sparks and other ignition
 sources.

Incompatible materials : Acids
 Chlorine
 Metals
 nitrates
 Strong bases
 Strong oxidizing agents
 strong reducing agents

Hazardous decomposition
 products : acid vapors
 carbon dioxide and carbon monoxide
 Nitrogen oxides (NOx)
 Ammonia

11. TOXICOLOGICAL INFORMATION

Information on likely routes of
 exposure : Inhalation
 Skin contact

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Eye Contact
Ingestion

Acute toxicity

Not classified based on available information.

Product:

Acute oral toxicity : LD 50 (Rat): > 5.000 mg/kg

Acute dermal toxicity : LD 50 (Rat): > 2.000 mg/kg

Components:

CITRIC ACID, MONOHYDRATE:

Acute oral toxicity : LD 50 (Rat): 3 g/kg

Skin corrosion/irritation

Not classified based on available information.

Product:

Result: Not irritating to skin

Components:

CITRIC ACID, MONOHYDRATE:

Result: Slightly irritating to skin

Serious eye damage/eye irritation

Not classified based on available information.

Product:

Result: Mildly irritating to eyes

Remarks: Unlikely to cause eye irritation or injury., Product dust may be irritating to eyes, skin and respiratory system.

Components:

CITRIC ACID, MONOHYDRATE:

Result: Severely irritating to eyes

Respiratory or skin sensitisation

Skin sensitisation: Not classified based on available information.

Respiratory sensitisation: Not classified based on available information.

Germ cell mutagenicity

Not classified based on available information.

Carcinogenicity

Not classified based on available information.

Reproductive toxicity

Not classified based on available information.

STOT - single exposure

Not classified based on available information.

STOT - repeated exposure


Not classified based on available information.

Aspiration toxicity

Not classified based on available information.

Product:

No aspiration toxicity classification

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Further information

Product:

Remarks: No data available

12. ECOLOGICAL INFORMATION

Ecotoxicity

Product:

- Toxicity to fish : LC 50 (Danio rerio (zebra fish)): > 10 mg/l
Exposure time: 96 h
Method: OECD Test Guideline 203
Remarks: Based on a similar product formulation.

- Toxicity to daphnia and other aquatic invertebrates : EC 50 (Water flea (Daphnia magna)): > 10 mg/l
Exposure time: 48 h
Method: OECD Test Guideline 202
Remarks: Based on a similar product formulation.

- Toxicity to bacteria : EC 50 (Pseudomonas putida): > 925 mg/l
Remarks: Information given is based on data on the components and the ecotoxicology of similar products.

Components:

CITRIC ACID, MONOHYDRATE:

- Toxicity to fish : LC 50 (Carassius auratus (goldfish)): 440 - 706 mg/l
Exposure time: 96 h

Persistence and degradability

Components:

No data available

Bioaccumulative potential

Components:

No data available

Mobility in soil

Components:

No data available

Other adverse effects

No data available

Product:

- Additional ecological information : An environmental hazard cannot be excluded in the event of unprofessional handling or disposal., Harmful to aquatic life with long lasting effects.

Components:

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13. DISPOSAL CONSIDERATIONS

Disposal methods

General advice : The product should not be allowed to enter drains, water courses or the soil.

Contaminated packaging : Empty remaining contents.
 Dispose of as unused product.
 Empty containers should be taken to an approved waste handling site for recycling or disposal.

14. TRANSPORT INFORMATION

International transport regulations

REGULATION

ID NUMBER	PROPER SHIPPING NAME	*HAZARD CLASS	SUBSIDIARY HAZARDS	PACKING GROUP	MARINE POLLUTANT / LTD. QTY.

INTERNATIONAL MARITIME DANGEROUS GOODS

Not dangerous goods

INTERNATIONAL AIR TRANSPORT ASSOCIATION - CARGO

Not dangerous goods

INTERNATIONAL AIR TRANSPORT ASSOCIATION - PASSENGER

Not dangerous goods

CHINA - ROAD

Not dangerous goods

CHINA - RAIL


Not dangerous goods

CHINA - INLAND WATERWAYS

Not dangerous goods

*ORM = ORM-D, CBL = COMBUSTIBLE LIQUID

Marine pollutant	no
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Dangerous goods descriptions (if indicated above) may not reflect quantity, end-use or region-specific exceptions that can be applied. Consult shipping documents for descriptions that are specific to the shipment.

15. REGULATORY INFORMATION

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

Workplace Safety and Health Act and Workplace Safety and Health (General Provisions) Regulations: This product is subjected to the SDS, labelling, PEL and other requirements in the Act/Regulations.

Singapore. Hazardous Substances Control List (Environmental Pollution Cont Substances) : Neither banned nor restricted

Singapore. CWC. Chemical Weapons (Prohibition) Act, (Schedule, Parts 1-3) as amended : Neither banned nor restricted

Singapore. Explosive Precursors (Arms and Explosives Act, Second Schedule, 2003 Revision, as amended) : Neither banned nor restricted

Singapore. Hazardous Substances Transport, Storage & Use Permissions (Environmental Protection and Management (Hazardous Substances) Regulations) : Neither banned nor restricted

The components of this product are reported in the following inventories:

TSCA : On TSCA Inventory

DSL : All components of this product are on the Canadian DSL.

AUSTR : On the inventory, or in compliance with the inventory

ENCS : On the inventory, or in compliance with the inventory

KECL : On the inventory, or in compliance with the inventory


PHIL : On the inventory, or in compliance with the inventory

IECSC : On the inventory, or in compliance with the inventory

Inventories

AICS (Australia), DSL (Canada), IECSC (China), REACH (European Union), ENCS (Japan), ISHL (Japan), KECI (Korea), NZIoC (New Zealand), PICCS (Philippines), TSCA (USA)

16. OTHER INFORMATION

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Further information

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

H319 Causes serious eye irritation.

Further information

Other information : The information accumulated herein is believed to be accurate but is not warranted to be whether originating with the company or not. Recipients are advised to confirm in advance of need that the information is current, applicable, and suitable to their circumstances. This MSDS has been prepared by the Solenis Environmental Health and Safety Department.

Sources of key data used to compile the Safety Data Sheet

Key literature references and sources of data

SOLENIS Internal data

SOLENIS internal data including own and sponsored test reports

The UNECE administers regional agreements implementing harmonised classification for labelling (GHS) and transport.

List of abbreviations and acronyms that could be, but not necessarily are, used in this safety data sheet :

ACGIH : American Conference of Industrial Hygienists

BEI : Biological Exposure Index

CAS : Chemical Abstracts Service (Division of the American Chemical Society).

CMR : Carcinogenic, Mutagenic or Toxic for Reproduction

FG : Food grade

GHS : Globally Harmonized System of Classification and Labeling of Chemicals.

H-statement : Hazard Statement

IATA : International Air Transport Association.

IATA-DGR : Dangerous Goods Regulation by the "International Air Transport Association" (IATA).

ICAO : International Civil Aviation Organization

ICAO-TI (ICAO) : Technical Instructions by the "International Civil Aviation Organization"

IMDG : International Maritime Code for Dangerous Goods

ISO : International Organization for Standardization

logPow : octanol-water partition coefficient

LCxx : Lethal Concentration, for xx percent of test population

LDxx : Lethal Dose, for xx percent of test population.

ICxx : Inhibitory Concentration for xx of a substance

Ecxx : Effective Concentration of xx

N.O.S.: Not Otherwise Specified

OECD : Organization for Economic Co-operation and Development

OEL : Occupational Exposure Limit


P-Statement : Precautionary Statement

PBT : Persistent , Bioaccumulative and Toxic

PPE : Personal Protective Equipment

STEL : Short-term exposure limit

STOT : Specific Target Organ Toxicity

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TLV : Threshold Limit Value
TWA : Time-weighted average
vPvB : Very Persistent and Very Bioaccumulative
WEL : Workplace Exposure Level

AU OEL : Australia. Workplace Exposure Standards for Airborne Contaminants.
CN OEL : China. Occupational Exposure Limits
HK OEL : Hong Kong. Code of Practice on Control of Air Impurities (Chemical Substances) in the Workplace
IN OEL : India. Permissible levels of certain chemical substances in work environment.
ID OEL : Indonesia. Occupational Exposure Limits
JPJSH OEL : Japan. The Japan Society for Occupational Health. Recommendation of Occupational Exposure Limits
JPISHL OEL : Japan. Administrative Control Levels
KOR OEL : Korea. Occupational Exposure Limits
MY OEL : Malaysia. Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health)
NZ OEL : New Zealand. Workplace Exposure Standards for Atmospheric Contaminants
PH OEL : Philippines. Threshold Limit Values For Airborne Contaminants
SG OEL : Singapore. Workplace Safety and Health Act - First Schedule Permissible Exposure Limits of Toxic Substances
TW OEL : Taiwan. Standards on the Concentration Levels of Hazardous Substances in the Air at Workplace
TH OEL : Thailand. Occupational Exposure Limits
VN OEL : Vietnam. Occupational Exposure Limits