Enviromelt-Material Safety Data Sheet

Product Name	Enviromelt - ECO-ST

1. Information about the Chemical Product and Company

A. Product Name — Enviromelt ECO-ST

B. Recommended use of the chemical and restrictions on use

Recommended use of the chemical	Deicer
Restrictions on use	Do not mix with other liquid products

C. Supplier information (in the case of imported goods, the contact information of local suppliers must be provided)

Name of Company	STARs tech Co., Ltd
Address	Room 1607, G-HIGH CITY, 243 Digital-ro, Guro-gu, Seoul, Korea

2. Hazards Identification

A.Hazard·Risk Classification

Severe eye damage/eye irritation : Sortation 1

Reproductive toxicity : Sortation 2

Specific target organ toxicity (repeated exposure) : Sortation 2

B. Items labeled with warning·precautionary statements

Symbol

Signal Word	Danger
Hazard·Risk Statement	H318 Causes severe eye damage. H335 May cause respiratory irritation. H373 Prolonged or repeated exposure to the skin may cause irritation.
Precautionary Statement	
Prevention	P201 Obtain the Instruction Manual before use. P202 Do not handle until all safety precautions have been read and understood. P260 Do not breathe dust/fume/gas/mist/vapors/spray. P261 Do not breathe dust/fume/gas/mist/vapors/spray. P271 Handle it outdoors or in a well-ventilated area. P280 Wear protective gloves/protective clothing/eye protection/face protection.
Response	P304+P340 If inhaled, move to fresh air and keep at rest in a comfortable position for breathing. P305+P351+P338 If there is eye contact, rinse thoroughly with water for few minutes. If possible, remove contact lenses and continue to rinse P308+P313 If exposed or exposure is feasible seek medical advice. P310 Immediately get clinical check from medical institutions. P312 If you feel uncomfortable, seek medical advice. P314 If you feel uncomfortable, seek medical advice.

Response	P391 Collect all spillage.
Storage	P403+P233 Keep container tightly closed in a well-ventilated place P405 Store in a lockable storage area.
Disposal	P501 Dispose the contents container according to the applicable regulations.

3. Name and Composition of Components

Name of Chemical	Other Name	CAS Number or Identification Number	Composition (%)
SODIUM HEXAMETAPHOSPHATE		10124-56-8	
GLYCERINE		57516-88-8	
CALCIUM CARBONATE		471-34-1	Confidential
CALCIUM CHLORIDE		10043-52-4	
SODIUM CHLORIDE		7647-14-5	

4. First Aid Measures

A. Eye Contact

If there is eye contact, rinse thoroughly with water for few minutes. If possible, remove contact lenses and continue to rinse.

Get emergency medical attention.

B. Skin Contact

If you feel uncomfortable, seek medical advice.

C. Inhalation

Seek emergency medical advice.

If excessive dust or fumes are present, remove with clean air and seek medical attention if coughing or other symptoms occur.

D. Ingestion

If substance is ingested or inhaled, do not use artificial respiration with mouth-to-mouth method and use appropriate respiratory medical equipment.

E. Other physician's notes

Take special first aid measures from health care professional institutions.

Have the medical personnel know about the material and take protective measures.

5. Fire-fighting Measures

A. Extinguishing Media

Extinguishing Media

Use alcohol foam, carbon dioxide or water spray for extinguishment.

Use dry sand or soil for smothering extinguishment.

B. Specific Hazard

Specific Hazard

Container may explode on heating.

Some may burn, but won't easily ignite

Non-flammable substance itself will not burn but can decompose during heating and may cause corrosive or toxic fumes.

C. Special Protective Equipment & Precautions for Fire-fighters

Rescuers should wear appropriate protective equipment.

Extinguish the area and maintain safety distance from the area.

Be aware that it may be melted and transported.

Drill ditches for the disposal of extinguish waters and keep them from dispersing.

Move container from the fire area if it is not hazardous.

In case of tank fire, extinguish at the maximum distance or use unmanned fire fighting equipment.

In case of tank fire, cool the containers with large amounts of water even after the fire has been extinguished.

In case of tank fire, if there is a loud sound level from the pressure relief device or a discoloration of the tank, immediately isolate from the area.

Isolate from the area if the tank is in flame.

In the event of a large fire in the tank, use unmanned fire fighting equipment and if not possible isolate from the area and let the tank burn.

6.Accidental Release Measures

A. Personal precautions and protective equipment	Prevent from inhalation of dust, fume, gas, mist, steam, spray.
	Wipe off spill and follow all prtoective precautions.
	If you do not need to enter or do not have protective equipment, do not enter.
	Remove all ignition sources.
	Stop the leak if it is not dangerous.
	Do not touch the damaged container or leakage without wearing the protective equipment.
	Cover with plastic sheet to prevent diffusion.
	Prevent dust formation.
	Note the substances and conditions to avoid.
B. Environmental protection equipment	Prevent entry into basements and confined spaces.
C. Purification or Removal Procedures	Collect all spillage.
	Absorb spillage with inert material (e.g. dry sand or soil) and place it in a chemical waste ontainer.
	In case of large spills, make ditches far apart from the spillage.
	Clean the spillage by using a clean shovel and container and isolate the container from the leak area.
	If there is a leakage of powders, cover with plastic sheets to prevent spreading.
	Absorb with sand or other non-combustible material in small leakages and place it in a container.

7. Handling and Storage

A. Safe Handling	Do not handle until all safety precautions have been read and understood.
	Prevent from inhalation of dust/fume/gas/mist/vapors/spray.
	Handle it outdoors or in a well-ventilated area.
	Follow all MSDS/label precautions as product residues may remain after emptying containers.
	Handle and store carefully.
	Note the substances and conditions to avoid.
	Be aware of the high temperatures.
B. Safe Storage	Keep container tightly closed in a well-ventilated area.

8. Exposure Controls / Personal Protection

A. Exposure Standards for Chemicals

Local Regulations	None
	None
ACGIH Regulations	None
	None
Biological Exposure Standards	None
	None
Other Exposure Regulations	None
	None

B. Engineering Controls	Use engineering isolation local exhaust ventilation or other engineering controls to keep air levels below exposure limit.
	If dust, fumes or mist is generated during operation, ventilate to keep air contamination below the exposure limit.

C. Personal protective equipment

Respiratory Protection	Wear respiratory protection approved by the Occupational Safety and Health Act according to the physicochemical properties of the particles being exposed.
	Face-to-face dustproof mask or air filtration type dust mask (high efficiency particulate filter material) or electric fan attachment dusk mask (dust, mist, fume filter medium).

9. Physical and Chemical Properties

A. Appearance	
Phase	None
Color	None
B. Odor	None
C. Odor Threshold	None
D. pH	None
E. Melting Point/Boiling Point	None
F. Boiling Point Range	None
G. Flash Point	None
H. Evaporation Rate	None
I. Flammability (Solid, Gas)	None
J. Upper/Lower Flammability Limits	None
K. Vapor Pressure	None
L. Solubility	None
M. Vapor Density	None
N. Relative Vapor Density	None
O. n-octanol/Water partition coefficient	None
P. Auto-ignition temperature	None
Q. Decomposition temperature	None
R. Viscosity	None
S. Molecular Weight	None

10. Stability and Reactivity

A. Chemical stability & Possibility of hazardous reactions

Some may burn, but won't easily ignite.

Non-flammable substance itself will not burn but can decompose during heating and may cause corrosive or toxic fumes.

B. Conditions to avoid

Heat, spark, flame, ignition source

C. Incompatible materials

Flammable material, reducing material

D. Hazardous decomposition products

Irritating and toxic gas may be produced during burning, pyrolysis or combustion.

Corrosive/toxic Hume

Irritant, corrosive, toxic gas

11. Toxicological Information

A Information about possible exposure paths

None

B Information on toxicological effects

Acute Toxicity

Oral	LD50 1940 ㎎/㎏ Mouse
	LD50 3000 ㎎/㎏ Rat
Skin	LD50 > 5000 ㎎/㎏ Rabbit
	LD50 > 10000 ㎎/㎏ Rabbit
Inhalation	Powder LC50> 10.5 ㎎/ℓ 4 hr Rat

Skin corrosion/irritation	Acute irritation Rabbit
Serious eye damage/irritation	Acute irritation Rabbit
Respiratory sensitisation	None
Skin sensitisation	None
Carcinogenicity	None
Aspiration Hazard	None
Other Harmful Effects	None

12. Ecological Information

A. Ecotoxicity

Pisces	LC50 4630 ㎎/ℓ 96 hr Pimephales promelas LC50 5840 ㎎/ℓ 96 hr Lepomis macrochirus (Reliability 1, ASTM E729)
Shellfish	EC50 2400 ㎎/ℓ 48 hr Daphnia magna LC50 874 ㎎/ℓ 48 hr Daphnia magna (Reliability 2, Standard methods for the Examination of Water and Waste Water)
Birds	EC50 2900 ㎎/ℓ 72 hr Selenastrum capricornutum EC50 0.0269 ㎎/ℓ 72 hr ((Pseudokirchneriella subcapitata, Growth Rate)_신뢰도 1, OECD Guideline 201, GLP)

B. Persistence and Degradability

Persistence	log Kow 0.05 log Kow -0.46
Degradability	None

C. Bio-accumulative potential

Condensability	BCF 3.162
Biodegradability	None
D. Mobility in Soil	None
E. Other Adverse Effects	None

13. Disposal Considerations

A. Disposal Method	Dispose contents and containers according to the waste management law regulations.
B. Disposal Considerations	Dispose contents according to the applicable regulations.

14. Transport Information

A. UN No.	No information available on the UN Transport Hazard Classification.
B. Proper Shipping Name	Not applicable

C. Hazard rating in transport	None
D. Container Rating	None
E. Marine Pollutants	None
F. Special Safety Measures	
Emergency measures in case of fire	None
Emergency measures in case of leakage	None

15. Legal Regulations

A. Industrial Safety and Health Act Regulations	None
B. Chemical Substance Control Act Regulations	None
C. Safety Control of Dangerous Substances Act Regulations	None
D. Wastes Control Act Regulations	None
E. Other Local and International Regulations	
Local Regulations	None
International Regulations	
US Administration Information(OSHA Regulation)	None
US Administration Information(CERCLA Regulation)	None
US Administration Information(EPCRA 302 Regulation)	None
US Administration Information(EPCRA 304 Regulation)	None
US Administration Information(EPCRA 313 Regulation)	None
US Administration Information(Rotterdam Convention Material)	None
US Administration Information(Stockholm Convention Material)	None
US Administration Information(Montreal Convention Material)	None
EU Classification Information(Confirmed Classification Result)	Xi; R36
EU Classification Information(Hazard Phrases)	R36
EU Classification Information(Safety Phrases)	S2, S22, S24

16. Reference Details

A. Sources of Data

HSDB(Appearance)

HSDB(Color)

HSDB(Odor)

HSDB(Melting Point)

HSDB(Boiling Point Range)

SIDS(Vapor Pressure)

HSDB(Solubility)

HSDB(Relative Vapor Density)

QSAR(n-octanol/Water partition coefficient)

HSDB(Viscosity)

HSDB(Molecular Weight)

SIDS(Oral)

SIDS(Skin)

SIDS(Skin Irritation)

SIDS(Eye Irritation)

SIDS(Germ cell mutagenicity)

SIDS(Specific target organ toxicity (single exposure))

SIDS(Fish)

SIDS(Seashell)

SIDS(Bird)

QSAR(Persistence)

The Chemical Database, The Department of Chemistry at the University of Akron(http://ull.chemistry.uakron.edu/erd)(appearance)

The Chemical Database, The Department of Chemistry at the University of Akron(http://ull.chemistry.uakron.edu/erd)(color)

The Chemical Database, The Department of Chemistry at the University of Akron(http://ull.chemistry.uakron.edu/erd)(odor)

The Chemical Database, The Department of Chemistry at the University of Akron(http://ull.chemistry.uakron.edu/erd)(pH)

The Chemical Database, The Department of Chemistry at the University of Akron(http://ull.chemistry.uakron.edu/erd)(melting point)

The Chemical Database, The Department of Chemistry at the University of Akron(http://ull.chemistry.uakron.edu/erd)(boilingpointrange)

The Chemical Database, The Department of Chemistry at the University of Akron(http://ull.chemistry.uakron.edu/erd)(vaporpressure)

The Chemical Database, The Department of Chemistry at the University of Akron(http://ull.chemistry.uakron.edu/erd)(solubility)

The Chemical Database, The Department of Chemistry at the University of Akron(http://ull.chemistry.uakron.edu/erd)(Relativevapordensity)

Quantitative Structure Activity Relation(n-octanol/Water partition coefficient)

The Chemical Database, The Department of Chemistry at the University of Akron(http://ull.chemistry.uakron.edu/erd)(Moleccular Weight)

International Uniform ChemicaL Information Database(IUCLID)(http://ecb.jrc.it/esis)(oral)

Corporate Solution From Thomson Micromedex(http://csi.micromedex.com)(skin)

Corporate Solution From Thomson Micromedex(http://csi.micromedex.com)(inhalation)

International Uniform ChemicaL Information Database(IUCLID)(http://ecb.jrc.it/esis)(skin irritation)

Echa(eye irritation)

ECHA(Germ cell mutagenicity)

ECHA(Reproductive toxicity)

Corporate Solution From Thomson Micromedex(http://csi.micromedex.com)(Specific target organ toxicity (single exposure))

ECHA(Specific target organ toxicity (repeated exposure))

1985년 ECHA(Fish)

1989년 ECHA(Seashell)

2005년 ECHA(Bird)

Quantitative Structure Activity Relation(QSAR)(Persistence)

Quantitative Structure Activity Relation(QSAR)(Enrichment)

○ Material Safety Data Sheets (MSDS) are prepared and edited with reference to MSDS provided by the Korea Occupational Safety and Health Agency.