

Material Safety Data Sheet

PART ONE: IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UDERTAKING

1.1 Chemical Name/Commercial Name: VEEA 2-(2-ethenoxyethoxy)ethyl prop-2-enoate

CAS No.: 86273-46-3

Product Code: VEEA

Company Name: Runhe Chemical (Guangzhou) Co., LTD

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1.2 The relevant identified application of the substance or mixture and the suggested unsuitable application

No data

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PART TWO: HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

Flammable liquids	Not applicable
Acute toxicity (oral)	Category 4
Acute toxicity (dermal)	Not applicable
Acute toxicity (inhalation: fumes)	Not applicable
Skin corrosion/irritation	Not applicable
Serious eye damage/ irritation	Not applicable
Respiratory or skin sensitization	Skin: Category 1
Germ cell mutagenicity	Not applicable
Reproductive toxicity	Not applicable
Aquatic environmental hazard (acute toxicity)	Category 2
Aquatic environmental hazard (chronic toxicity)	Not applicable

2.2 Labeling Elements

Symbols/Pictograms



2.3 Signal Word

WARNING

2.4 Hazard Statement

Harmful if swallowed;

May cause allergic skin reactions;

Toxic to aquatic organisms

2.5 Precautionary Statement

Wash thoroughly after handling;

No eating, drinking or smoking in the workplace;

Avoid inhaling gases, fumes, vapors, sprays;

Contaminated work clothes must not be taken out of the workplace;

Wear protective gloves specified by the manufacturer, supplier or competent authority;

Prohibit discharge into the environment if it is not intended for that purpose

2.6 Other Hazards

No data

PART THREE: COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substance

Chemical Name	2-(2-ethenoxyethoxy)ethyl prop-2-enoate
CAS No.	86273-46-3
Concentration	> 98.5

3.2 Other Information

China (IECSC): Not included (applied) ;

USA (TSCA) : Included ;

Canada (DSL) : Included ;

Australia (AICS) : Included ;

South Korea (ECL) : Included (2011-3-5146) ;

Japan (ENCS) : Included (2-4028) ;

Chemical name of impurities and stabilizers belonging to GHS classification: No data;

Content of impurities and stabilizers belonging to GHS classification: No data

PART FOUR: FIRST AID MEASURES

4.1 First Aid Statement

Skin contact: Flush the infected area with plenty of water and soap. If blistering or inflammation occurs, seek medical attention immediately

Eye contact: Immediately and carefully flush with water for 15 minutes or more. When rinsing, separate the eyelids with your hand to ensure that the entire eye is thoroughly rinsed. If contact lenses are worn and can be easily removed, remove them and continue rinsing;

Ingestion: Do not induce vomiting after ingestion. Drink 1 to 2 glasses of water and seek immediate medical attention. Do not feed anything by mouth to an unconscious patient;

Inhalation: Move the patient to fresh air, keep him/her warm and quiet, and keep him/her at rest. Seek immediate medical attention;

Acute and delayed effects: Harmful if swallowed; may cause anaphylactic skin reactions

4.2 First-aid Personnel Statement

Use PPE as required, any indication that requires immediate medical attention and specialized treatment, follow symptomatic treatment

Any indication requiring immediate medical attention and special treatment: follow symptomatic treatment. Treatment may vary depending on the patient's condition and the specific circumstances of the accident. Emergency on-site treatment is essential in all potential poisoning situations. Present the label and SDS on the container when seeking medical attention

PART FIVE: FIRE-FIGHTING MEASURES

5.1 Suitable extinguishing agent

Resistant to alcohol-based foams, carbon dioxide, chemical dry powders, and fogged water

5.2 Unsuitable extinguishing agents

No data

5.3 Special hazards caused by chemicals

In a fire, the substance may release toxic gases (carbon monoxide, etc.);

5.4 Protective equipment and precautions for firefighters

Firefighters must wear full protective equipment with positive pressure self-contained breathing apparatus (SCBA) in any enclosed area where irritating and highly toxic gases are generated by combustion or thermal decomposition.

5.5 Fire Fighting Methods

Firefighters must wear full firefighting clothing with positive pressure self-contained breathing apparatus (SCBA) and fight the fire upwind to avoid inhaling toxic fumes. When extinguishing the fire, remove containers from the fire as far as possible to an open area and cool them, or cool the environment by fogging water. Evacuate people who may be affected downwind as soon as possible

5.6 Fire Fighting Precautions and Measures

Use appropriate extinguishing agents as specified by the manufacturer/supplier or the competent authority in case of fire;

Surrounding fire situation: move containers away from the fire if safe to do so. Extinguish containers and packages with an appropriate extinguishing agent and cool them with fog water if they cannot be moved;

In case of fire: first cut off the source of combustion, then use appropriate extinguishing agent to extinguish the fire from upwind direction;

Recycling and disposal of firefighting effluent;

PART SIX: ACCIDENTAL RELEASE MEASURES

6.1 Personal Precautions, Protective Equipment and Emergency Procedures

Disposal personnel should wear appropriate protective equipment during disposal to avoid skin and eye contact and inhalation of vapors. Strict full-body cleaning procedures should be followed upon completion of accidental disposal

6.2 Environmental Precautions

Do not wash this product into soil, sewers, drains or any other body of water. Dispose of collected spills as industrial hazardous waste;

6.3 Containment and removal of spilled chemicals and disposal materials used

Small spills: Hydrolyze and neutralize with a 5-10% caustic soda solution, and then rinse residual leakage from the spill area with a large amount of water. The wash water should be disposed of appropriately (incineration, activated sludge);

Large spills: Enclose the leakage liquid with dry sand, then cover the leakage with oil-resistant anti-static sheet to inhibit vapor evaporation, and use the same disposal method for recovery as for small amount of leakage

Spills in water: Large spills: Use dry sand to contain the leakage liquid, then cover the leakage with oil-resistant anti-static sheet to inhibit vapor evaporation, and adopt the same disposal method as that for small amount of leakage for recovery

6.4 Emergency Disposal Procedures

Keep adequate ventilation in the spill area and remove all ignition sources (including non-explosion proof electrical equipment)

In the case of a large spill, evacuate all unnecessary and unprotected persons to a safe area upwind. Do not touch or step on the spill

6.5 Precautions to prevent secondary hazards from occurring

Contaminated surfaces should be thoroughly cleaned after treatment. Ensure that any source of ignition at the site of the spill area is removed, that fireworks are strictly prohibited, and that the site is adequately ventilated to avoid secondary accidents.

PART SEVEN: HANDLING AND STORAGE

7.1 Safe Handling Precaution

Handling should be carried out in a well-ventilated area without leakage, spillage or spreading. Minimize vapor generation and accumulation. Prevent containers from leaking during handling.

The workplace should eliminate all sources of ignition (including non-explosion-proof electrical equipment), avoid unnecessary high temperatures during operation, avoid temperatures close to or above flash points, avoid heating closed containers, and take measures to prevent static hazards (e.g., grounding).

Operate from upwind direction

Do not contact with strong oxidizers, peroxides, acids, iron to avoid ignition or polymerization. Avoid brutal operation such as throwing, dropping, banging, dragging containers

Operators should refer to "Part Eight" for appropriate personal protection against skin, eye and clothing contact and inhalation of vapors. The substance may carry a static charge. Wear anti-static clothing and anti-static shoes to avoid electrifying the body. Smoking, eating and drinking are prohibited in the workplace. Remove contaminated clothing and protective equipment, shower and change clothes immediately after work.

7.2 Safe storage conditions, including any incompatibilities

Store in a cool, dry, well-ventilated area. Avoid direct sunlight and high temperature. Keep away from heat and ignition sources, smoke and fire are strictly prohibited. If stored in tanks, keep the liquid temperature below 40°C and the oxygen phase concentration within 7~21% (polymerization reaction may occur when the oxygen concentration is below 7vol%). Explosion-proof electrical equipment should be used in the storage place and all equipment is grounded

7.3 Safe storage conditions, including any incompatibilities

Keep the container sealed and intact, and do not store with strong oxidizing substances, peroxides, acids and iron

7.4 Packaging materials

Stainless steel or polyethylene containers, sealable packaging materials

PART EIGHT: EXPOSURE CONTROL AND PERSONAL PROTECTION

8.1 Control Parameters

Do not use this product in areas without adequate ventilation, use process closure equipment, localized ventilation and exhaust equipment, or other engineering controls. Safety showers and eyewash facilities need to be provided in the workplace and clearly identified. Contaminated coveralls are not allowed to be taken out of the workplace and should be cleaned before reuse. Avoid discharging to the environment if not for intended use.

8.2 Exposure control

Personal protective equipment

Respiratory protection: Wear a suitable chemical-filtering respirator containing an organic gas canister or a positive pressure self-contained breathing apparatus.

Hand protection: Wear suitable chemical resistant gloves, butyl rubber (e.g., North Butyl black rubber gloves) or polyethylene-polyvinyl alcohol laminated rubber (e.g., Dailove T-1);

Eye protection: Wear appropriate side protection glasses, goggles or face shields;

Body protection: Wear appropriate protective clothing, aprons, work shoes and boots;

General safety and health measures: No smoking, eating or drinking during operation. Pay attention to personal cleanliness and hygiene. Seek immediate medical treatment/counseling if exposed or concerned. Follow a strict full-body wash procedure at the end of the operation.

PART NINE: PHYSICAL AND CHEMICAL PROPERTIES

9.1 Basic physical and chemical properties

Appearance	Colorless liquid
Odor	Slight ester odor
Odor Threshold	No data
pH	5.74 (1% aqueous solution, 25°C)
Melting Point	< -70.9
Freezing Point	< -70.9
Boiling Point	94°C
Flashing Point	118.6°C
Evaporation Rate	No data
Flammability	non-hazardous
Upper Explosive Limit	No data
Lower Explosive Limit	No data
Flammability Point	No data
Vapour Pressure	4.13 (25°C)

Density / Relative Density	1.0458 (20°C)
Relative Vapour Density	No data
Solubility / Water Solubility	In water: 18.38 g/L (20°C) , Easily soluble in toluene
Logarithmic value of octanol/water partition coefficient	1.7
Auto-ignition Temperature	214 °C
Decomposition Temperature	No data
Kinematic Viscosity	No data
Kinetic Viscosity	No data
Explosiveness	No data
Oxidability	No data
Surface tension	33.9 dyn/cm (25°C) In aqueous solution: 63.4 mN/m (20.8°C)

PART TEN: STABILITY AND REACTIVITY

10.1 Chemical Stability

Heat, light, exposure to strong oxidizing substances, peroxides, acids and iron may cause dangerous polymerization reactions;

10.2 Hazardous Reactions

Polymerization may occur at storage temperatures above 40 ° C or oxygen concentrations below 7vol%;

10.3 Possible Hazardous Chemical Reactions

Polymerization

10.4 Conditions to Avoid

Keep away from high temperature, heat sources, sparks and flames, avoid direct sunlight and static hazards, and avoid heating closed containers;

10.5 Incompatible materials

Strong oxidizing substances, peroxides, acids, iron;

10.6 Hazardous substances from decomposition

The substance may release toxic gases (carbon monoxide, etc.) during a fire;

PART ELEVEN: TOXICOLOGICAL INFORMATION**Acute toxicity**

Rat oral: LD50 = 2026 mg/kg (male) 1), 1790 mg/kg (female) 1) (Method: OECD Guideline No. 401);

Rat oral: LD50=300 to 2000 mg/kg 1) (Method: 96/54/EEC B.1 tris, OECD guideline No.423);

Rat dermal: LD50>2000 mg/kg 1) (Method: 92/69/EEC B.3, OECD Guideline No.402);

Rat inhalation (smoke): LC50 = 5.82 mg/L (4hr)1) (Method: 440/2008/EEC B.2, OECD Guideline No. 403) ;

Skin corrosion/irritation

Rabbit: Slightly irritating (P.I.I. = 2.0)1) (Method: OECD Guideline No. 404);

Serious eye damage/irritation

Rabbit: No irritation (Method: 92/69/EEC B.5, OECD Guideline No. 405);

Respiratory or skin allergy

Mouse: Skin sensitizer (Method: OECD Guideline No. 429 (local lymph node test));

Germ cell mutagenicity

Salmonella typhimurium TA98, TA100, TA1535, TA1537 and Escherichia coli WP2 uvr A Ames Test: Negative) (Methods: New Chemical Substance Test (Japan Kampoan No. 287, Eisei No. 127: October 31, 1997; Kikyoku No. 2: October 31, 1997)

Chinese hamster lung cell (CHL / IU) in vitro chromosomal aberration test: negative) (Method: 2000/32/ECL1362000 Appendix 4A, OECD Guideline No. 473);

In vivo mouse micronucleus test: no genotoxicity (Method: 440/2008/EEC B.12, OECD Guideline No. 474);

L5178Y mouse lymphoma cell line test: non-mutagenic (Method: 440/2008/EEC, OECD Guideline No. 476);

Carcinogenicity

Not listed in IARC, NTP, EU, OSHA and ACGIH;

Reproductive toxicity

Reproductive and developmental toxicity: Rat oral: NOAEL = 400 mg/kg/d1), NOEL = 400

mg/kg/d1) (Method: OECD Guideline No. 422);

Chronic or long term toxicity: rat oral: 28d-NOAEL = 160 mg/kg/d1), NOEL = 50 mg/kg/d1)
(Method: 92/69/EEC B.7, OECD Guideline No. 407);

Developmental toxicity

No data

Specific target organ toxicity (single exposure)

No data

Specific target organ toxicity (repeated exposure)

No data

Inhalation hazard

No data

Toxicokinetics, Metabolism and Distribution

No data

Others

No data

PART TWELVE: ECOLOGICAL INFORMATION

12.1 Toxicity

Fish: Danio rerio 96hr: LC50=6.8 mg/L 1), LC100=10 mg/L1), NOEC=2.2 mg/L1), LOEC=4.6 mg/L1) (Method: 92/69/EEC C.1, OECD Guideline No. 203);

Crustaceans: Daphnia magna 48hr: EC50=55 mg/L1), EC100=100 mg/L1), NOEC=25 mg/L1)
(Method: 92/69/EEC C.2, OECD Guideline No. 202);

Algae or other aquatic plants: freshwater algae 72hr: EC50 biomass 5.0 mg/L1), growth rate 10 mg/L1)

EC10 biomass 1.4 mg/L1), growth rate 3.2 mg/L1)

EC90 biomass 18 mg/L1), growth rate 33 mg/L1)

NOEC biomass 0.78 mg/L1), growth rate 0.78 mg/L1)

LOEC biomass 2.7 mg/L1), growth rate 2.7 mg/L1)

(Method: 92/69/EEC C.3, OECD Guideline No. 201);

Aerobic activated sludge 3hr: EC50 = 741 mg/L1)

(Method: 88/302/EEC C.11, OECD Guideline No. 209);

12.2 Persistence and Degradability

Hydrolytic degradability: $t_{1/2}$ 1.8 hr (pH=4.0, 25° C)²⁾

200.1 hr (pH=7.0, 25°C)²⁾

66.9 hr (pH=9.0, 25° C)²⁾ (Method: 96/69EEC C.7, OECD Guideline No.111)

Biodegradability: Rapid biodegradation 28 days BOD=82.1 %¹⁾, TOC=84.4 %¹⁾, GC=100.0 %¹⁾

(Method: OECD Guideline No. 301C);

12.3 Potential Bioaccumulation

Log Pow=1.7¹⁾ (Method: 92/69/EEC A.8, OECD Guideline No.117) ;

12.4 Migration in soil

Very high migration KOC = 15¹⁾ (log KOC = 1.2) (Method: 2001/59/EEC C.19, OECD Guideline No.121) ;

12.5 Other hazardous effects

No data

PART THIRTEEN: DISPOSAL CONSIDERATIONS

13.1 Disposal method

The substance must be disposed of in accordance with local and national laws and regulations;

It is strictly prohibited to dump the product into soil, sewers, drains, groundwater or any body of water. Avoid discharging into the environment if not intended for use;

It is recommended to dispose of the substance by incineration using a chemical incinerator equipped with a post-boosting combustion chamber and a scrubbing device or by entrusting it to a professional waste disposal organization;

Contaminated packaging containers for disposal may also be considered for this method;

13.2 Disposal Precautions

All containers or packaging that left residue must also be disposed of in accordance with local and national laws and regulations. Empty containers may have residue of the substance and should be emptied completely and disposed of in accordance with the relevant instructions. Do not put other substances into the container or use the container for other purposes. Empty and wash containers thoroughly before disposal. Refer to "Part Eight" for personal protective measures for disposal workers. If a professional waste disposal organization is entrusted to handle the waste, a contract should be signed and the content of the waste should be clearly defined; if the product or the waste

generated in the process of production and use is classified as hazardous waste, it should be properly disposed of in accordance with the relevant national regulations on the disposal of waste.

PART FOURTEEN: TRANSPORT INFORMATION

14.1 UN Number

No data

14.2 UN Proper Shipping Name

No data

14.3 UN Classification of Dangerousness

No data

14.4 Packing Type

No data

14.5 Packing Mark

No data

14.6 Packing method

No data

14.7 Marine Pollutants (Yes/No)

No

14.8 Precautions for transportation

Carry protective equipment and fire extinguishers. Before transporting loads, check containers for leakage; ensure smooth, secure loading to prevent containers from sliding, falling and being damaged. Ensure vehicle is grounded before transporting liquids to avoid static hazards. When unloading hoses from tanker trucks, carefully remove any residue from them. Protect from exposure to sun, rain, and high temperatures. It should not be transported together with strong oxidizing substances, peroxides, acids, iron, and there should be no residue of prohibited compounds in the container. Although it is not classified as dangerous goods, it is better to comply with ICAO, IMDG, RID, ADR, ADN regulations in transportation.

PART FIFTEEN: REGULATORY INFORMATION

15.1 Regulatory information

The Regulations on the Safe Management of Dangerous Chemicals (Decree of the State Council No. 591 of 2011), the Regulations on the Safe Use of Chemicals in the Workplace ([1996] Ministry of Labor Issue No. 423) and other laws and regulations have provided corresponding rules on the safe use as well as the production, storage, transportation, loading and unloading of chemical hazards.

According to "Classification of Chemicals and Hazardous Publication - General Rules" (GB13690-2009), "List of Dangerous Goods" (GB12268-2005), "List of Dangerous Chemicals" (2002 edition), "Classification of Dangerous Goods and Product Numbers" (GB6944-2005), "Limits of Occupational Exposure to Hazardous Factors in the Workplace Part 1: Chemical Hazards" (GB 20589-2006), Safety rules for classification、precautionary labeling and precautionary statements of chemicals-Flammable liquid (GB 20581-2006)、Safety rules for classification、precautionary labeling and precautionary statements of chemicals-Self-igniting liquid (GB 20585-2006)、Safety rules for classification、precautionary labeling and precautionary statements of chemicals-Oxidizing Liquid (GB 20589-2006)、Safety rules for classification、precautionary labeling and precautionary statements of chemicals-Explosives (GB 20576-2006)、Safety rules for classification、precautionary labeling and precautionary statements of chemicals-Self-Reactive Substances (GB 20583-2006)、Safety rules for classification、precautionary labeling and precautionary statements of chemicals-Self-Heating Substances (GB 20584-2006)、Safety rules for classification、precautionary labeling and precautionary statements of chemicals-Substances emitting flammable gases in contact with water (GB 20587-2006)、Safety rules for classification、precautionary labeling and precautionary statements of chemicals-Corrosion of Metals (GB 20588-2006)、Safety rules for classification、precautionary labeling and precautionary statements of chemicals-Organic Peroxides (GB 20591-2006)、Safety rules for classification、precautionary labeling and precautionary statements of chemicals-Acute Toxicity (GB20592-2006)、《Safety rules for classification、precautionary labeling and precautionary statements of chemicals-Skin corrosion/irritation (GB20593-2006)、Safety rules for classification、precautionary labeling and precautionary statements of chemicals-Severe eye damage/eye irritation (GB 20594-2006)、Safety rules for classification、precautionary labeling and precautionary statements of chemicals-Respiratory or Skin Sensitization (GB20595-2006)、Safety rules for classification、precautionary labeling and precautionary statements of chemicals-Germ Cell Mutagenicity(GB20596-2006)、Safety rules for classification、precautionary labeling and precautionary statements of chemicals-Carcinogenicity (GB 20597-2006)、Safety rules for classification、precautionary labeling and precautionary statements of chemicals-Reproductive Toxicity (GB 20598-2006)、Safety rules for classification、precautionary labeling and precautionary statements of chemicals-Specific Target

Organ System Toxicity - One Exposure (GB20599-2006)、Safety rules for classification、precautionary labeling and precautionary statements of chemicals-Specific Target Organ System Toxicity - Repeated Exposure (GB 20601-2006)、Safety rules for classification、precautionary labelling and precautionary statements of chemicals-Hazards to the Aquatic Environment (GB 20602-2006) to classify and identify the substance. All users are required to utilize and comply with the operator protection measures and environmental emission controls specified in this Chemical Safety Data Sheet (SDS) as well as in regulations issued by the State Administration of Work Safety (SAWS), the Ministry of Environmental Protection (MEP) of the People's Republic of China, the Ministry of Health (MOH), and the Ministry of Human Resources and Social Security (MHR&SS), among others.

15.2 HSE management regulations for this product

Law of the People's Republic of China on Prevention and Control of Occupational Diseases (Presidential Decree No. 60 of 2001, amended by Presidential Decree No. 52 of 2011): Personal protection should be strengthened at work sites to prevent occupational diseases.

Specification for the Selection of Individual Protective Equipment (GB/T 11651-2008): Appropriate individual protective measures should be selected according to the hazard category of the workplace.

This product is not listed in China's List of Dangerous Goods (GB12268-2005), List of Dangerous Chemicals (2002 edition), Catalog of Highly Toxic Substances (2003 edition), Catalog of Hypertoxic Chemicals (2002 edition), Catalogue of Classification and Varieties of Easily Poisonous Chemicals (Decree of the State Council 445, 2005), Catalog of Toxic Chemicals Strictly Restricted for Import and Export in China, Catalog of Prohibited Imported Goods

PART SIXTEEN: OTHER INFORMATION

16.1 References

Rules for the Preparation of the Chemical Safety Information Sheet Part 2 (GB/T 17519.2-2003);
Globally Unified System of Classification and Labeling of Chemicals (GHS) (ST/SG/AC.10/30);
Specification for GHS-based Labeling of Chemicals (GB/T 22234-2008);
Contents and Sequence of Items in Technical Instructions for Chemical Safety (GB/T 16483-2008);
General Rules for the Evaluation of Chemical Hazards (GB/T22225-2008);
Regulations on the Preparation of Chemical Safety Labels (GB15258-2009);

Classification of Chemicals and Public Announcement of Dangerousness - General Rules
(GB13690-2009);

Rules for Transportation of Dangerous Goods by Vehicle (JT617-2004);

DISCLAIMER

The information provided in this Material Safety data Sheet is correct based on the latest knowledge, information and perceptions available to us. The information provided is only a guide to safe operation, use, processing, storage, transport, disposal and discharge and shall not be intended for a guarantee or quality specification. The information only applies to the specific substance and may not apply to substances combined with any other substances or substances processed in any way, unless it is stated in the text. The product recipient is responsible for ensuring compliance with any ownership and current laws and regulations.