



Material Safety Data Sheet

1. PRODUCT AND COMPANY IDENTIFICATION

EBR™-SR™ 14 Advanced Edge Bead Remover

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Supplier ROHM AND HAAS ELECTRONIC MATERIALS LLC
A Subsidiary of The Dow Chemical Company
455 FOREST STREET
MARLBOROUGH, MA 01752 United States

For non-emergency information contact: 215-592-3000

Emergency telephone number
1 800 424 9300

Local emergency telephone number
989-636-4400

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2. COMPOSITION/INFORMATION ON INGREDIENTS

Component	CAS-No.	Concentration
Electronic grade propylene glycol monomethyl ether acetate	108-65-6	< 35.0 %
Ethyl lactate	97-64-3	< 35.0 %
Electronic grade propylene glycol monomethyl ether	107-98-2	< 35.0 %

3. HAZARDS IDENTIFICATION

Emergency Overview

Appearance

Form liquid

Colour clear

Odour mild

Hazard Summary

WARNING!

Combustible liquid and vapor. Causes irritation to eyes, nose, and respiratory tract.
Prolonged, repeated contact, inhalation, ingestion, or absorption through the skin, may cause adverse effects to internal organ systems.

Potential Health Effects

Primary Routes of Entry: Inhalation, ingestion, eye and skin contact, absorption.

Eyes: May cause pain, transient irritation and superficial corneal effects.

Skin: Material may cause irritation.

Prolonged or repeated exposure may have the following effects:

drowsiness

defatting and drying of the skin which can lead to irritation and dermatitis

central nervous system depression

kidney damage

liver damage

Ingestion: Swallowing may have the following effects:

irritation of mouth, throat and digestive tract

Headache

Nausea

Vomiting

Repeated doses may have the following effects:

central nervous system depression

liver damage

kidney damage

Inhalation: Inhalation may have the following effects:

irritation of nose, throat and respiratory tract

Higher concentrations may have the following effects:

systemic effects similar to those resulting from ingestion

Target Organs: Eye

Respiratory System

nervous system

Liver

Kidney

Skin

Carcinogenicity

Not considered carcinogenic by NTP, IARC, and OSHA

4. FIRST AID MEASURES

Inhalation: Remove from exposure. If there is difficulty in breathing, give oxygen. Seek medical attention if symptoms persist.

Skin contact: Wash skin with water. Continue washing for at least 15 minutes. Obtain medical attention if blistering occurs or redness persists.

Eye contact: Immediately flush the eye with plenty of water for at least 15 minutes, holding the eye open. Obtain medical attention if soreness or redness persists.

Ingestion: Wash out mouth with water. Have victim drink 1-3 glasses of water to dilute stomach contents. Induce vomiting if person is conscious. Immediate medical attention is required. Never administer anything by mouth if a victim is losing consciousness, is unconscious or is convulsing.

Notes to physician: Treat symptomatically.

5. FIREFIGHTING MEASURES

Flash point 39 °C (102 °F)
Lower explosion limit no data available
Upper explosion limit no data available

Suitable extinguishing media: Use water spray, foam, dry chemical or carbon dioxide. Keep containers and surroundings cool with water spray.

Specific hazards during firefighting: This product may give rise to hazardous vapors in a fire. Vapors can travel a considerable distance to a source of ignition and result in flashback.

Special protective equipment for firefighters: Wear full protective clothing and self-contained breathing apparatus.

Further information: Pressure may build up in closed containers with possible liberation of combustible vapors.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions

Wear suitable protective clothing.
Wear respiratory protection.
Eliminate all ignition sources.

Environmental precautions

Prevent the material from entering drains or water courses.
Do not discharge directly to a water source.
Advise Authorities if spillage has entered watercourse or sewer or has contaminated soil or vegetation.

Methods for cleaning up

Contain spills immediately with inert materials (e.g., sand, earth).
Transfer into suitable containers for recovery or disposal.
Finally flush area with plenty of water.

7. HANDLING AND STORAGE

Handling

Use local exhaust ventilation. Avoid contact with eyes, skin and clothing. Keep container tightly closed.

Storage

Storage conditions: Store in original container. Keep away from heat and sources of ignition.

Storage area should be: cool dry well ventilated out of direct sunlight

Further information on storage conditions: Keep away from heat, sparks, flame, and other sources of ignition. Practice good personal hygiene to prevent accidental exposure.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure limit(s)

Exposure limits are listed below, if they exist.

Component	Regulation	Type of listing	Value
Electronic grade propylene glycol monomethyl ether acetate	Rohm and Haas	TWA	30 ppm
Electronic grade propylene glycol monomethyl ether acetate	Rohm and Haas	TWA	30 ppm
Electronic grade propylene glycol monomethyl ether acetate	Rohm and Haas	STEL	90 ppm
Electronic grade propylene glycol monomethyl ether acetate	Rohm and Haas	STEL	90 ppm
Electronic grade propylene glycol monomethyl ether acetate	Rohm and Haas	Absorbed via skin	
Electronic grade propylene glycol monomethyl ether acetate	Rohm and Haas	Absorbed via skin	
Electronic grade propylene glycol monomethyl ether acetate	US WEEL	TWA	50 ppm
Ethyl lactate	Rohm and Haas	TWA	5 ppm
Electronic grade propylene glycol monomethyl ether	Rohm and Haas	TWA	100 ppm
Electronic grade propylene glycol monomethyl ether	Rohm and Haas	STEL	150 ppm
Electronic grade propylene glycol monomethyl ether	ACGIH	TWA	50 ppm
Electronic grade propylene glycol monomethyl ether	ACGIH	STEL	100 ppm
Electronic grade propylene glycol monomethyl ether	OSHA P0	TWA	360 mg/m3 100 ppm
Electronic grade propylene glycol monomethyl ether	OSHA P0	STEL	540 mg/m3 150 ppm

Electronic grade propylene glycol monomethyl ether	NIOSH REL	TWA	360 mg/m3	100 ppm
Electronic grade propylene glycol monomethyl ether	NIOSH REL	ST	540 mg/m3	150 ppm

Exposure controls

Engineering measures: Engineering methods to prevent or control exposure are preferred. Methods include process or personnel enclosure, mechanical ventilation (local exhaust), and control of process conditions.

Individual protection measures

Eye/face protection: Goggles

Skin protection

Hand protection: Butyl rubber gloves. Other chemical resistant gloves may be recommended by your safety professional.

Other protection: Normal work wear.

Respiratory protection: Respiratory protection if there is a risk of exposure to high vapor concentrations. The specific respirator selected must be based on the airborne concentration found in the workplace and must not exceed the working limits of the respirator.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Form	liquid
Colour	clear
Odour	mild

Boiling point/boiling range 148 °C (298 °F)

Flash point 39 °C (102 °F)

Evaporation rate Slower than ether

Lower explosion limit no data available

Upper explosion limit no data available

Component: **Electronic grade propylene glycol monomethyl ether acetate**

Vapour pressure 3.7 mmHg at 20 °C (68 °F)

Component: **Ethyl lactate**

Vapour pressure 1.7 mmHg at 20 °C (68 °F)

Component: **Electronic grade propylene glycol monomethyl ether**

Vapour pressure 10.9 mmHg

Relative vapor density Heavier than air.

Relative density	0.97
Water solubility	completely soluble
VOC's	970.00 g/L

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

10. STABILITY AND REACTIVITY

Chemical stability	Stable under normal conditions.
Hazardous reactions	No dangerous reaction known under conditions of normal use.
Conditions to avoid	Static discharge. high temperatures.
Materials to avoid	Strong oxidizing agents Strong bases Reducing agents strong acids
Hazardous decomposition products	Combustion will generate:, oxides of carbon, acrid smoke and irritating fumes,
polymerisation	Product will not undergo hazardous polymerization.

11. TOXICOLOGICAL INFORMATION

Toxicological information on this product or its components appear in this section when such data is available.

Carcinogenicity:

Not considered carcinogenic by NTP, IARC, and OSHA

Component: **Electronic grade propylene glycol monomethyl ether acetate**

Acute oral toxicity LD50 rat > 5,000 mg/kg

Component: **Ethyl lactate**

Acute oral toxicity LD50 rat > 2,000 mg/kg OECD Test Guideline 425

Component: **Electronic grade propylene glycol monomethyl ether**

Acute oral toxicity Low toxicity if swallowed.
Small amounts swallowed incidentally as a result of normal handling operations are not likely to cause injury; however, swallowing larger amounts may cause injury.

Component: **Electronic grade propylene glycol monomethyl ether**

Acute oral toxicity LD50 rat 4,016 mg/kg

Component: **Electronic grade propylene glycol monomethyl ether acetate**

- Acute inhalation toxicity** LC50 rat 6 Hour > 10.8 mg/l
- Component: **Ethyl lactate**
- Acute inhalation toxicity** LC0 rat 4 Hour 5.4 mg/l
- Component: **Electronic grade propylene glycol monomethyl ether**
- Acute inhalation toxicity** Brief exposure (minutes) is not likely to cause adverse effects.
The odor is objectionable at 100 ppm; higher levels produce eye, nose, and throat irritation and are intolerable at 1000 ppm. Anesthetic effects are seen at or above 1000 ppm.
- Component: **Electronic grade propylene glycol monomethyl ether**
- Acute inhalation toxicity** LC50 rat 6 Hour > 25.8 mg/l
- Component: **Electronic grade propylene glycol monomethyl ether acetate**
- Acute dermal toxicity** LD50 rabbit > 5,000 mg/kg
- Component: **Ethyl lactate**
- Acute dermal toxicity** LD50 rat > 5,000 mg/kg
- Component: **Electronic grade propylene glycol monomethyl ether**
- Acute dermal toxicity** Prolonged skin contact is unlikely to result in absorption of harmful amounts.
- Component: **Electronic grade propylene glycol monomethyl ether**
- Acute dermal toxicity** LD50 rabbit > 2,000 mg/kg
- Component: **Electronic grade propylene glycol monomethyl ether acetate**
- Skin irritation** No skin irritation
Prolonged contact is essentially nonirritating to skin.
Repeated contact may cause skin irritation with local redness.
- Component: **Electronic grade propylene glycol monomethyl ether**
- Skin irritation** No skin irritation
Prolonged contact may cause slight skin irritation with local redness.
Repeated contact may cause slight skin irritation with local redness.
- Component: **Electronic grade propylene glycol monomethyl ether acetate**
- Eye irritation** No eye irritation
May cause pain disproportionate to the level of irritation to eye tissues.
May cause slight eye irritation.
May cause slight corneal injury.
- Component: **Ethyl lactate**
- Eye irritation** moderate to severe.
Single application to the rabbit eye produced conjunctival irritation.
- Component: **Electronic grade propylene glycol monomethyl ether**
- Eye irritation** No eye irritation
May cause slight temporary eye irritation.
Corneal injury is unlikely.
- Component: **Electronic grade propylene glycol monomethyl ether acetate**

Sensitisation NOT a contact sensitizer
Did not cause allergic skin reactions when tested in guinea pigs.

Component: Electronic grade propylene glycol monomethyl ether acetate

Sensitisation For respiratory sensitization:
No relevant data found.

Component: Ethyl lactate

Sensitisation no data available

Component: Electronic grade propylene glycol monomethyl ether

Sensitisation Did not cause allergic skin reactions when tested in guinea pigs.

Component: Electronic grade propylene glycol monomethyl ether

Sensitisation For respiratory sensitization:
No relevant data found.

Component: Electronic grade propylene glycol monomethyl ether acetate

Subchronic toxicity In animals, effects have been reported on the following organs:
Kidney.
Liver.
Nasal tissue.

Component: Electronic grade propylene glycol monomethyl ether acetate

Carcinogenicity: Similar material(s) did not cause cancer in laboratory animals.

Component: Electronic grade propylene glycol monomethyl ether acetate

Reproductive toxicity

In animal studies, did not interfere with reproduction. In animal studies, did not interfere with fertility.

Component: Electronic grade propylene glycol monomethyl ether acetate

Teratogenicity

Did not cause birth defects or other effects in the fetus even at doses which caused toxic effects in the mother.

Component: Electronic grade propylene glycol monomethyl ether acetate

Mutagenicity

In vitro genetic toxicity studies were negative.

Component: Ethyl lactate

Carcinogenicity: no data available

Component: Ethyl lactate

Reproductive toxicity

no data available

Component: Ethyl lactate

Teratogenicity

Development effects were not observed in laboratory animals.

Component: Ethyl lactate

Mutagenicity

Reverse mutation test using bacteria: Non-mutagenic with and without metabolic activation

Component: Electronic grade propylene glycol monomethyl ether

Subchronic toxicity Symptoms of excessive exposure may be anesthetic or narcotic effects; dizziness and drowsiness may be observed. In animals, effects have been reported on the following organs:
Kidney.
Liver.

Component: **Electronic grade propylene glycol monomethyl ether**

Carcinogenicity: Did not cause cancer in laboratory animals.

Component: **Electronic grade propylene glycol monomethyl ether**

Reproductive toxicity

In laboratory animal studies, effects on reproduction have been seen only at doses that produced significant toxicity to the parent animals.

Component: **Electronic grade propylene glycol monomethyl ether**

Teratogenicity

Has been toxic to the fetus in laboratory animals at doses toxic to the mother. Did not cause birth defects in laboratory animals.

Component: **Electronic grade propylene glycol monomethyl ether**

Mutagenicity

In vitro genetic toxicity studies were negative. Animal genetic toxicity studies were negative.

12. ECOLOGICAL INFORMATION

Ecotoxicological information on this product or its components appear in this section when such data is available.

Electronic grade propylene glycol monomethyl ether acetate

Elimination information (persistence and degradability)

Biodegradability

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

Material is ultimately biodegradable (reaches > 70% mineralization in OECD test(s) for inherent biodegradability).

Biodegradability

OECD Test Guideline 301F or Equivalent Biodegradable

83 %

10-day Window: Pass

Biodegradability

OECD Test Guideline 302B or Equivalent

100 %

10-day Window: Not applicable

Ecotoxicity effects

Toxicity to fish

Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).

Toxicity to fish

LC50 Oncorhynchus mykiss (rainbow trout) 96 Hour no data available
134 mg/l

Toxicity to algae

static test ErC50 Pseudokirchneriella subcapitata 96 Hour OECD Test Guideline 201 or Equivalent
> 1,000 mg/l

Toxicity to aquatic invertebrates EC50 Daphnia magna (Water flea) 48 Hour no data available
408 mg/l

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

Ethyl lactate

Elimination information (persistence and degradability)

Biodegradability OECD Test Guideline 302
75 %

Ecotoxicity effects

Toxicity to fish LC50 Zebra fish (Danio/Brachydanio rerio) 96 Hour OECD Test
Guideline 203 or Equivalent
320 mg/l

Toxicity to algae ErC50 green alga Pseudokirchneriella subcapitata (formerly known as
Selenastrum capricornutum) 96 Hour
3,500 mg/l

Toxicity to aquatic invertebrates EC50 Daphnia magna (Water flea) 48 Hour
560 mg/l

Electronic grade propylene glycol monomethyl ether

Elimination information (persistence and degradability)

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

Biodegradability OECD Test Guideline 301E or Equivalent Biodegradable
96 %
10-day Window: Pass

Ecotoxicity effects

Toxicity to fish Material is practically non-toxic to aquatic organisms on an acute basis
(LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species
tested).

Toxicity to fish static test LC50 Leuciscus idus (Golden orfe) 96 Hour DIN 38412
6,812 mg/l

Toxicity to fish semi-static test LC50 Oncorhynchus mykiss (rainbow trout) 96 Hour
OECD Test Guideline 203 or Equivalent
≥ 1,000 mg/l

Toxicity to fish static test LC50 Pimephales promelas (fathead minnow) 96 Hour
OECD Test Guideline 203 or Equivalent
20,800 mg/l

Toxicity to algae static test ErC50 Pseudokirchneriella subcapitata (green algae) 7 d
OECD Test Guideline 201 or Equivalent
> 1,000 mg/l

Toxicity to bacteria	static test IC50 activated sludge > 1,000 mg/l
Toxicity to aquatic invertebrates	static test LC50 Daphnia magna (Water flea) 48 Hour OECD Test Guideline 202 or Equivalent 21,100 - 25,900 mg/l
Chemical Fate	
Chemical Oxygen Demand (COD)	1.84 mg/g

13. DISPOSAL CONSIDERATIONS

Environmental precautions: Prevent the material from entering drains or water courses. Do not discharge directly to a water source. Advise Authorities if spillage has entered watercourse or sewer or has contaminated soil or vegetation.

Disposal

Dispose in accordance with all local, state (provincial), and federal regulations. Incineration is the recommended method of disposal for containers. Under RCRA, it is the responsibility of the product's user to determine at the time of disposal, whether the product meets RCRA criteria for hazardous waste. This is because the product uses, transformations, mixtures, processes, etc. may render the resulting materials hazardous.

Do not remove label until container is thoroughly cleaned. Empty containers may contain hazardous residues. This material and its container must be disposed of in a safe way.

14. TRANSPORT INFORMATION

DOT

Not regulated per 49CFR 173.150(f)(2)

Classification for SEA transport (IMO-IMDG):

Proper shipping name	FLAMMABLE LIQUID, N.O.S.(Ethyl lactate, Propylene glycol monomethyl ether acetate)
UN number	UN 1993
Class	3
Packing group	III

Transportation classifications may vary by container volume and may be influenced by regional or country variations in regulations.

15. REGULATORY INFORMATION

Workplace Classification

OSHA: Combustible
Irritant

WHMIS: This product is a 'controlled product' under the Canadian Workplace Hazardous Materials Information System (WHMIS).

SARA TITLE III: Section 311/312 Categorizations (40CFR370): Immediate, delayed, flammability hazard

SARA TITLE III: Section 313 Information (40CFR372)

This product does not contain a chemical which is listed in Section 313 at or above de minimis concentrations.

United States TSCA Inventory (TSCA): All components of this product are in compliance with the inventory listing requirements of the U.S. Toxic Substances Control Act (TSCA) Chemical Substance Inventory.

California (Proposition 65)

This product does not contain materials which the State of California has found to cause cancer, birth defects or other reproductive harm.

16. OTHER INFORMATION

NFPA Hazard Rating

Health	Fire	Reactivity
2	2	0

Legend

ACGIH	American Conference of Governmental Industrial Hygienists
BAC	Butyl acetate
OSHA	Occupational Safety and Health Administration
PEL	Permissible Exposure Limit
STEL	Short Term Exposure Limit (STEL):
TLV	Threshold Limit Value
TWA	Time Weighted Average (TWA):
	Bar denotes a revision from prior MSDS.

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

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