



Safety Data Sheet acc. to OSHA HCS

Printing date 04/10/2023

Revision date 04/10/2023

1 Identification

- **Product identifier**
- **Trade name:** Ethylene Oxide Residual Solvent (CRM)
- **Article number:** 38277
- **Application of the substance / the mixture**
This product is for research use - Not for human or veterinary diagnostic or therapeutic use.
- **Details of the supplier of the safety data sheet**
- **Manufacturer/Supplier:**
Cayman Chemical Co.
1180 E. Ellsworth Rd.
Ann Arbor, MI 48108
USA
- **Information department:** Product safety department
- **Emergency telephone number:**
During normal opening times: +1 (734) 971-3335
US/CANADA: 800-424-9300
Outside US/CANADA: 703-741-5970

2 Hazard(s) identification

- **Classification of the substance or mixture**



GHS08 Health hazard

Germ Cell Mutagenicity 1B H340 May cause genetic defects.
Carcinogenicity 1B H350 May cause cancer.
Toxic to Reproduction 1B H360 May damage fertility or the unborn child.



GHS07

Acute Toxicity - Dermal 4 H312 Harmful in contact with skin.
Acute Toxicity - Inhalation 4 H332 Harmful if inhaled.
Flammable Liquids 4 H227 Combustible liquid.

- **Label elements**
- **GHS label elements**

The product is classified and labeled according to the Globally Harmonized System (GHS).

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· Hazard pictograms



GHS07 GHS08

· Signal word Danger

· Hazard-determining components of labeling:

N,N-dimethylacetamide
ethylene oxide

· Hazard statements

H227 Combustible liquid.
H312+H332 Harmful in contact with skin or if inhaled.
H340 May cause genetic defects.
H350 May cause cancer.
H360 May damage fertility or the unborn child.

· Precautionary statements

P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.
P210 Keep away from flames and hot surfaces. – No smoking.
P261 Avoid breathing dust/fume/gas/mist/vapors/spray
P271 Use only outdoors or in a well-ventilated area.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P302+P352 If on skin: Wash with plenty of water.
P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P308+P313 IF exposed or concerned: Get medical advice/attention.
P312 Call a poison center/doctor if you feel unwell.
P321 Specific treatment (see on this label).
P362+P364 Take off contaminated clothing and wash it before reuse.
P370+P378 In case of fire: Use CO₂, powder or water spray to extinguish.
P403+P235 Store in a well-ventilated place. Keep cool.
P405 Store locked up.
P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

· Classification system:

· NFPA ratings (scale 0 - 4)



Health = 1
Fire = 2
Reactivity = 0

· HMIS-ratings (scale 0 - 4)



Health = *1
Fire = 2
Reactivity = 0

· Other hazards

· Results of PBT and vPvB assessment

- PBT: Not applicable.
- vPvB: Not applicable.

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3 Composition/information on ingredients

- **Chemical characterization: Mixtures**
- **Description:** Mixture of the substances listed below with nonhazardous additions.

- **Dangerous components:**

CAS: 127-19-5 RTECS: AB 7700000	N,N-dimethylacetamide	99.9%
CAS: 75-21-8 RTECS: KX 2450000	ethylene oxide	0.1%

4 First-aid measures

- **Description of first aid measures**
- **General information:**
Immediately remove any clothing soiled by the product.
Symptoms of poisoning may even occur after several hours; therefore medical observation for at least 48 hours after the accident.
- **After inhalation:**
Supply fresh air. If required, provide artificial respiration. Keep patient warm. Consult doctor if symptoms persist.
In case of unconsciousness place patient stably in side position for transportation.
- **After skin contact:** Immediately rinse with water.
- **After eye contact:** Rinse opened eye for several minutes under running water.
- **After swallowing:** If symptoms persist consult doctor.
- **Information for doctor:**
- **Most important symptoms and effects, both acute and delayed**
No further relevant information available.
- **Indication of any immediate medical attention and special treatment needed**
No further relevant information available.

5 Fire-fighting measures

- **Extinguishing media**
- **Suitable extinguishing agents:**
CO₂, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
- **Special hazards arising from the substance or mixture** No further relevant information available.
- **Advice for firefighters**
- **Protective equipment:** Mouth respiratory protective device.

6 Accidental release measures

- **Personal precautions, protective equipment and emergency procedures**
Wear protective equipment. Keep unprotected persons away.
- **Environmental precautions:**
Dilute with plenty of water.
Do not allow to enter sewers/ surface or ground water.
- **Methods and material for containment and cleaning up:**
Absorb with liquid-binding material (sand, diatomite, acid binders, sawdust).
Dispose contaminated material as waste according to section 13.
Ensure adequate ventilation.

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- **Reference to other sections**

See Section 7 for information on safe handling.

See Section 8 for information on personal protection equipment.

See Section 13 for disposal information.

- **Protective Action Criteria for Chemicals**

- **PAC-1:**

127-19-5	N,N-dimethylacetamide	30 ppm
75-21-8	ethylene oxide	5 ppm

- **PAC-2:**

127-19-5	N,N-dimethylacetamide	67 ppm
75-21-8	ethylene oxide	45 ppm

- **PAC-3:**

127-19-5	N,N-dimethylacetamide	400 ppm
75-21-8	ethylene oxide	200 ppm

7 Handling and storage

- **Handling:**

- **Precautions for safe handling**

Ensure good ventilation/exhaustion at the workplace.

Open and handle receptacle with care.

Prevent formation of aerosols.

- **Information about protection against explosions and fires:**

Keep ignition sources away - Do not smoke.

Keep respiratory protective device available.

- **Conditions for safe storage, including any incompatibilities**

- **Storage:** Store in accordance with information listed on the product insert.

- **Requirements to be met by storerooms and receptacles:** No special requirements.

- **Information about storage in one common storage facility:** Not required.

- **Further information about storage conditions:** Keep receptacle tightly sealed.

- **Specific end use(s)** No further relevant information available.

8 Exposure controls/personal protection

- **Additional information about design of technical systems:** No further data; see section 7.

- **Control parameters**

- **Components with limit values that require monitoring at the workplace:**

127-19-5 N,N-dimethylacetamide

PEL Long-term value: 35 mg/m³, 10 ppm
Skin

REL Long-term value: 35 mg/m³, 10 ppm
Skin

TLV Long-term value: 10 ppm
Skin; BEI, A3

75-21-8 ethylene oxide

PEL Short-term value: 5 ppm
Long-term value: 1 ppm
see 29 CFR 1910.1047(c)

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REL	Long-term value: 0.18 mg/m ³ , <0.1 ppm Ceiling limit value: 9* mg/m ³ , 5* ppm See Pocket Guide App. A; *10-min/day
TLV	Long-term value: 1 ppm BEI, Skin, A2

· **Ingredients with biological limit values:**

127-19-5 N,N-dimethylacetamide

BEI	30 mg/g creatinine Medium: urine Time: end of shift at end of workweek Parameter: N-Methylacetamide
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75-21-8 ethylene oxide

BEI	5000 pmol HEV/g globin Medium: hemoglobin adducts Time: not critical Parameter: N-(2-hydroxyethyl)valine (HEV) (nonspecific) (workers having representative Ethylene oxide exposure during the previous 120 days)
	5 µg HEMA/g creatinine Medium: urine Time: end of shift Parameter: S-(2-hydroxyethyl)mercapturic acid (HEMA) (Population based, nonspecific)

· **Additional information:** The lists that were valid during the creation were used as basis.

· **Exposure controls**

· **Personal protective equipment:**

· **General protective and hygienic measures:**

Keep away from foodstuffs, beverages and feed.
Immediately remove all soiled and contaminated clothing.
Wash hands before breaks and at the end of work.
Store protective clothing separately.
Avoid contact with the eyes and skin.

· **Breathing equipment:**

In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use respiratory protective device that is independent of circulating air.

· **Protection of hands:**



Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation. Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.

Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation

· **Material of gloves**

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.

· **Penetration time of glove material**

The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.

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· Eye protection:



Tightly sealed goggles

9 Physical and chemical properties

· Information on basic physical and chemical properties

· General Information

· Appearance:

Form:

Liquid

Color:

According to product specification

· Odor:

Characteristic

· Odor threshold:

Not determined.

· Formulation

A solution in N,N-dimethylacetamide

· pH-value:

Not determined.

· Change in condition

Melting point/Melting range:

-20 °C (-4 °F)

Boiling point/Boiling range:

165.5 °C (329.9 °F)

· Flash point:

66 °C (150.8 °F)

· Flammability (solid, gaseous):

Not applicable.

· Auto igniting:

390 °C (734 °F)

· Decomposition temperature:

Not determined.

· Ignition temperature:

Product is not selfigniting.

· Danger of explosion:

Not determined.

· Explosion limits:

Lower:

1.7 Vol %

Upper:

11.5 Vol %

· Vapor pressure at 20 °C (68 °F):

3.3 hPa (2.5 mm Hg)

· Density at 20 °C (68 °F):

0.94335 g/cm³ (7.87226 lbs/gal)

· Relative density

Not determined.

· Vapor density

Not determined.

· Evaporation rate

Not determined.

· Solubility in / Miscibility with

Water:

Fully miscible.

· Partition coefficient (n-octanol/water):

Not determined.

· Viscosity:

Dynamic:

Not determined.

Kinematic:

Not determined.

· Solvent content:

VOC content:

0.00 %

0.0 g/l / 0.00 lb/gal

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Solids content: 0.0 %

· Other information No further relevant information available.

10 Stability and reactivity

- **Reactivity** No further relevant information available.
- **Chemical stability**
- **Thermal decomposition / conditions to be avoided:**
No decomposition if used according to specifications.
- **Possibility of hazardous reactions** No dangerous reactions known.
- **Conditions to avoid** No further relevant information available.
- **Incompatible materials:** No further relevant information available.
- **Hazardous decomposition products:** No dangerous decomposition products known.

11 Toxicological information

- **Information on toxicological effects**
- **Acute toxicity:**

- **LD/LC50 values that are relevant for classification:**

ATE (Acute Toxicity Estimate)

Oral	LD50	100,000 mg/kg (rat)
Dermal	LD50	1,101 mg/kg
Inhalative	LC50/4 h	11 mg/l

127-19-5 N,N-dimethylacetamide

Oral	LD50	4,930 mg/kg (rat)
Dermal	LD50	2,240 mg/kg (rabbit)

75-21-8 ethylene oxide

Oral	LD50	100 mg/kg (ATE)
		72 mg/kg (rat)
Inhalative	LC50/4 h	700 mg/l (ATE)
		2,671 mg/l (rat)

- **Primary irritant effect:**
- **on the skin:** No irritant effect.
- **on the eye:** No irritating effect.
- **Sensitization:** No sensitizing effects known.
- **Additional toxicological information:**

The product shows the following dangers according to internally approved calculation methods for preparations:

Harmful

The product can cause inheritable damage.

- **Carcinogenic categories**

- **IARC (International Agency for Research on Cancer)**

127-19-5	N,N-dimethylacetamide	2B
75-21-8	ethylene oxide	1

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· **NTP (National Toxicology Program)**

75-21-8 ethylene oxide

K

· **OSHA-Ca (Occupational Safety & Health Administration)**

75-21-8 ethylene oxide

12 Ecological information

- **Toxicity**
- **Aquatic toxicity:** No further relevant information available.
- **Persistence and degradability** No further relevant information available.
- **Behavior in environmental systems:**
- **Bioaccumulative potential** No further relevant information available.
- **Mobility in soil** No further relevant information available.
- **Additional ecological information:**
- **General notes:**
Water hazard class 3 (Self-assessment): extremely hazardous for water
Do not allow product to reach ground water, water course or sewage system, even in small quantities.
Danger to drinking water if even extremely small quantities leak into the ground.
- **Results of PBT and vPvB assessment**
- **PBT:** Not applicable.
- **vPvB:** Not applicable.
- **Other adverse effects** No further relevant information available.

13 Disposal considerations

- **Waste treatment methods**
- **Recommendation:**
Must not be disposed of together with household garbage. Do not allow product to reach sewage system.
- **Uncleaned packagings:**
- **Recommendation:** Disposal must be made according to official regulations.
- **Recommended cleansing agent:** Water, if necessary with cleansing agents.

14 Transport information

- | | |
|----------------------------------|---------------------------|
| · UN-Number | |
| · DOT | NA1993 |
| · IMDG, IATA | not regulated |
| · UN proper shipping name | |
| · DOT | COMBUSTIBLE LIQUID, N.O.S |
| · IMDG, IATA | not regulated |

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· Transport hazard class(es)

· DOT



· Class 3 Combustible liquids
 · Label 3
 · ADN/R Class: not regulated

· Packing group
 · DOT III
 · IMDG, IATA not regulated

· Environmental hazards: Not applicable.

· Special precautions for user Not applicable.

· Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code Not applicable.

· Transport/Additional information:

· DOT
 · Quantity limitations On passenger aircraft/rail: 60 L
 On cargo aircraft only: 220 L

· IATA
 · Remarks: When sold in quantities of less than or equal to 1 mL, or 1 g, with an Excepted Quantity Code of E1, E2, E4, or E5, this item meets the De Minimis Quantities exemption, per IATA 2.6.10. Therefore packaging does not have to be labeled as Dangerous Goods/Excepted Quantity.

· UN "Model Regulation": not regulated

15 Regulatory information

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

· Section 355 (extremely hazardous substances):

75-21-8 ethylene oxide

· Section 313 (Specific toxic chemical listings):

75-21-8 ethylene oxide

· TSCA (Toxic Substances Control Act):

All components have the value ACTIVE.

· Hazardous Air Pollutants

75-21-8 ethylene oxide

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· Proposition 65

· Chemicals known to cause cancer:

All ingredients are listed.

· Chemicals known to cause reproductive toxicity for females:

75-21-8 ethylene oxide

· Chemicals known to cause reproductive toxicity for males:

All ingredients are listed.

· Chemicals known to cause developmental toxicity:

All ingredients are listed.

· Carcinogenic categories

· EPA (Environmental Protection Agency)

75-21-8 ethylene oxide

CaH

· TLV (Threshold Limit Value)

127-19-5 N,N-dimethylacetamide

A4

75-21-8 ethylene oxide

A2

· NIOSH-Ca (National Institute for Occupational Safety and Health)

75-21-8 ethylene oxide

· National regulations:

· Information about limitation of use:

Workers are not allowed to be exposed to the hazardous carcinogenic materials contained in this preparation. Exceptions can be made by the authorities in certain cases.

· Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

16 Other information

All chemicals may pose unknown hazards and should be used with caution. This SDS applies only to the material as packaged. If this product is combined with other materials, deteriorates, or becomes contaminated, it may pose hazards not mentioned in this SDS. Cayman Chemical Company assumes no responsibility for incidental or consequential damages, including lost profits, arising from the use of these data. It shall be the user's responsibility to develop proper methods of handling and personal protection based on the actual conditions of use. While this SDS is based on technical data judged to be reliable, Cayman Chemical Company assumes no responsibility for the completeness or accuracy of the information contained herein.

· Department issuing SDS: Environment protection department.

· Contact: -

· Date of preparation / last revision 04/10/2023

· Abbreviations and acronyms:

IMDG: International Maritime Code for Dangerous Goods

DOT: US Department of Transportation

IATA: International Air Transport Association

EINECS: European Inventory of Existing Commercial Chemical Substances

ELINCS: European List of Notified Chemical Substances

CAS: Chemical Abstracts Service (division of the American Chemical Society)

NFPA: National Fire Protection Association (USA)

HMIS: Hazardous Materials Identification System (USA)

VOC: Volatile Organic Compounds (USA, EU)

LC50: Lethal concentration, 50 percent

LD50: Lethal dose, 50 percent

PBT: Persistent, Bioaccumulative and Toxic

vPvB: very Persistent and very Bioaccumulative

NIOSH: National Institute for Occupational Safety

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OSHA: Occupational Safety & Health

TLV: Threshold Limit Value

PEL: Permissible Exposure Limit

REL: Recommended Exposure Limit

BEI: Biological Exposure Limit

Flammable Liquids 4: Flammable liquids – Category 4

Acute Toxicity - Dermal 4: Acute toxicity – Category 4

Germ Cell Mutagenicity 1B: Germ cell mutagenicity – Category 1B

Carcinogenicity 1B: Carcinogenicity – Category 1B

Toxic to Reproduction 1B: Reproductive toxicity – Category 1B

US