

MATERIAL SAFETY DATA SHEET



LANXESS Corporation

Product Safety & Regulatory Affairs
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TRANSPORTATION EMERGENCY

CALL CHEMTREC: (800) 424-9300
INTERNATIONAL: (703) 527-3887

NON-TRANSPORTATION

LANXESS Emergency Phone: (800) 410-3063
LANXESS Information Phone: (800) LANXESS

1. Product and Company Identification

Product Name: VELCORIN
Material Number: 141694
Chemical Family: Dicarbonate
Chemical Name: Dimethyl Dicarbonate
Synonyms: Dicarbonic Acid, Dimethyl Ester, DMDC, Dimethyl Pyrocarbonate
CAS-No.: 4525-33-1
Formula: C₄H₆O₅

2. Hazards Identification

Emergency Overview

DANGER! **Color:** Colorless **Form:** Liquid **Odor:** ester-like, pungent.
Corrosive. Toxic. Combustible. Water runoff from fire fighting may be corrosive.
Vapors or mist may be a fire and explosion hazard when exposed to high temperature or ignition. Causes respiratory tract irritation. May be fatal if inhaled. Causes skin burns. Causes eye burns. Causes digestive tract burns. Harmful if swallowed.

Potential Health Effects

Primary Routes of Entry: Skin Contact, Eye Contact, Ingestion, Inhalation

Medical Conditions Aggravated by Exposure: Skin disorders, Respiratory disorders, Eye disorders

HUMAN EFFECTS AND SYMPTOMS OF OVEREXPOSURE

Inhalation

Acute Inhalation

For Component: Dimethyl Dicarbonate

Expected to be toxic by inhalation. Corrosive with symptoms of coughing, burning, ulceration, and pain. May cause pulmonary edema with symptoms of breathing difficulty and tightness of chest. Severe

inhalation exposure may cause collapse, coma, and possibly death. The odor of Velcorin is not strong enough or immediately irritating enough to act as a warning that one is being exposed. When first encountered, the odor is fruity, ester like at very low concentrations. Such exposure is likely to go unnoticed and even if noticed unlikely to cause an avoidance reaction. Even if exposure is abated immediately, there may be delayed symptoms of irritation of the nose, throat, and upper respiratory tract. Symptoms of nonspecific bronchial reactivity may result from exposure of persons with a tendency towards asthma or nonspecific hyperreactivity. At higher concentrations the Velcorin has a slightly pungent odor.

Skin

Acute Skin

For Component: Dimethyl Dicarbonate

Corrosive with symptoms of reddening, itching, swelling, burning and possible permanent damage.

Eye

Acute Eye

For Component: Dimethyl Dicarbonate

Corrosive with symptoms of reddening, tearing, swelling, burning and possible permanent damage.

Ingestion

Acute Ingestion

For Component: Dimethyl Dicarbonate

Toxic by ingestion. Harmful if swallowed. Corrosive to the digestive tract with symptoms of burning and ulceration.

General Effects of Exposure

Chronic Effects of Exposure

For Product: VELCORIN

No applicable information was found concerning any adverse chronic health effects from overexposure to this product.

Carcinogenicity:

No Carcinogenic substances as defined by IARC, NTP and/or OSHA.

3. Composition/Information on Ingredients

Hazardous Components

<u>Weight %</u>	<u>Components</u>	<u>CAS-No.</u>
100%	Dimethyl Dicarbonate	4525-33-1

4. First Aid Measures

Eye Contact

In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Use fingers to ensure that eyelids are separated and that the eye is being irrigated. Call a physician immediately.

Skin Contact

Wash off immediately with plenty of water for at least 15 minutes. Immediately remove contaminated clothing and shoes. Call a physician immediately. Wash clothing before reuse. Destroy contaminated shoes.

Inhalation

If inhaled, remove to fresh air. If not breathing, give artificial respiration using a pocket mask type resuscitator. If breathing is difficult, give oxygen. Call a physician immediately.

Ingestion

Immediately give large quantities of water to drink. Do not induce vomiting. Never give anything by mouth to an unconscious person.

Notes to physician

Inhalation - Observe for delayed pulmonary edema for 24-48 hours. Treat respiratory distress and bronchospasm according to conventional protocols. The use of corticosteroids should be considered in individual cases. Ingestion - Provide supportive care and observe for corrosive injury to GI tract and treat according to conventional protocols. The use of corticosteroids should be considered in individual cases. Velcorin (Dimethyl Dicarbonate) is hydrolyzed when in contact with water to carbon dioxide and methanol. Methanol toxicity should be considered in cases of significant ingestion. Consultation with a Toxicologist may be needed.

5. Fire-Fighting Measures

Suitable Extinguishing Media: All extinguishing media are suitable.

Special Fire Fighting Procedures

Firefighters should be equipped with self-contained breathing apparatus to protect against potentially toxic and irritating fumes. Use cold water spray to cool fire-exposed containers to minimize risk of rupture.

Unusual Fire/Explosion Hazards

Water runoff from fire fighting may be corrosive. Toxic and irritating gases/fumes may be given off during burning or thermal decomposition. Combustible Liquid. Vapors or mist may be a fire and explosion hazards when exposed to high temperature or ignition.

6. Accidental release measures**Spill and Leak Procedures**

Cleanup personnel must use appropriate personal protective equipment. Do not allow spilled material or wash water to enter sewers, surface waters, or groundwater systems. Remove all sources of ignition, including flames, heat, and sparks. Ventilate area to remove vapors or dust. Evacuate and keep unnecessary people out of spill area. Cover spill with damp, fluid-binding material (for example, sand, sawdust, chemical binder based on calcium silicate hydrate). Transfer to an open waste container after approximately one hour, cover loosely and remove to an isolated area. Do not seal the container as carbon dioxide given off by the slow reaction between Velcorin and water may cause a tightly sealed container to burst. Flush the spill with cold water but avoid flushing into open drains. Hot water should never be used for this purpose since it would cause considerable vaporization of the spilled material.

Use the paper Velcorin indicator strips to insure that there is no residual Dimethyl Dicarbonate in the air.

7. Handling and Storage**Storage Temperature:**

minimum: 20 °C (68 °F)

maximum: 30 °C (86 °F)

Storage Period

12 Months: Keep in a dry place. Expiration date on label is day/month/year.

Handling/Storage Precautions

Do not breathe vapours or spray mist. Do not get on skin or clothing. Do not get in eyes. Do not taste or swallow. Use only with adequate ventilation/personal protection. Wash thoroughly after handling. Keep container closed when not in use. Store in a dry place away from excessive heat in original or similar containers. Protect from freezing.

Further Info on Storage Conditions

Avoid extreme heat. Product can react with water. Avoid contact with moisture/water. Light sensitive. If the material does crystallize, it must be reliquified before being used. The recommended method to reliquify is to simply place the container in an appropriate storage area and allow it to gradually reach ambient temperatures. An alternative is to reliquify by gently heating it in a water bath. Do NOT apply heat/flame directly to container.

8. Exposure Controls / Personal Protection

Dimethyl Dicarbonate (4525-33-1)

LANXESS Exposure Limit

Ceiling Limit Value: 0.04 ppm

Industrial Hygiene/Ventilation Measures

Use local and general exhaust ventilation to control levels of exposure.

Respiratory Protection

The odor of Velcorin can not be used as a warning property against inhalation exposure. Air concentrations of Velcorin should not be allowed to exceed 0.04 ppm, even momentarily. A NIOSH approved air-purifying organic vapor respirator must be used when Velcorin concentrations are between >0.04 ppm and <10 ppm and during disposal. Positive pressure air-supplied respirators if concentrations are unknown or exceed 10 ppm or if the workspace is confined and unventilated. Use air-supplied respirators or self-contained breathing apparatus in emergency situations. Observe OSHA regulations for respirator use (29 CFR 1910.134)., The metering equipment, particularly the cabinet in which the bottle is kept, should be enclosed. The room housing the equipment should have adequate general room ventilation.

Hand Protection

PVC disposable gloves, Nitrile rubber gloves., After each use, immerse in cold water and discard.

Eye Protection

Chemical resistant goggles must be worn., Chemical safety goggles in combination with a full face shield if a splash hazard exists.

Skin and body protection

Permeation resistant clothing and foot protection., Wash carefully in cold water immediately after use.

Additional Protective Measures

Employees should wash their hands and face before eating, drinking, or using tobacco products. Educate and train employees in the safe use and handling of this product. Emergency showers and eye wash stations should be available.

9. Physical and chemical properties

Form:	Liquid
Color:	Colorless
Odor:	ester-like, pungent

pH:	Not Established
Freezing Point:	17 °C (62.6 °F)
Boiling Point/Range:	172.22 °C (342 °F)
Flash Point:	85 °C (185 °F) (DIN 51758)
Lower Explosion Limit:	3 %(V)
Upper Explosion Limit:	29.9 %(V)
Vapor Pressure:	Approximately 0.7 mbar @ 20 °C (68 °F)
Density:	approximately 1.25 g/cm ³ @ 20 °C (68 °F)
Solubility in Water:	Hydrolyzes 35 g/l @ 20 °C (68 °F)
Autoignition Temperature:	Approximately 465 °C (869 °F)
Viscosity, Dynamic:	Approximately 2.1 mPa.s
Bulk Density:	10.4 lb/gal
Molecular Weight:	134

10. Stability and Reactivity

Hazardous Reactions

Hazardous polymerization does not occur.

Stability

Stable

Materials to avoid

Water

Conditions to avoid

Avoid contact with moisture / water. Avoid extreme heat.

Hazardous decomposition products

By Fire and Thermal Decomposition: Methanol; Carbon oxides, nitrogen oxides (NO_x), other potentially toxic fumes

11. Toxicological Information

Toxicity Data for Dimethyl Dicarbonate

Acute Oral Toxicity

LD50: 335 mg/kg (rat, female)

LD50: 497 mg/kg (rat, male)

Acute Inhalation Toxicity

LC50: 711 mg/m³ (130 ppm), 4 hrs (rat, Male/Female)

(Rat)

Irritating to respiratory system.

Acute dermal toxicity

LD50: > 1,250 mg/kg (rat)

Skin Irritation

rabbit, Exposure Time: 1 - 2 hrs, Corrosive

Eye Irritation

rabbit, Corrosive

Repeated Dose Toxicity

12 months, Oral: (dog)
Various liquids (i.e. fruit juices and/or wine), serving as the only source of liquid for the test animals, were treated at 4000 ppm. No effects were observed.
90 day, inhalation: NOAEL: 0.23 mg/m³, (Rat,)

Mutagenicity

Genetic Toxicity in Vitro:
Ames: negative

Toxicity to Reproduction/Fertility

(Rat)

This study was conducted with treated beverages (orange juice treated with 4000 ppm) resulting in no observed effects.

Developmental Toxicity/Teratogenicity

Rat,

This study was conducted with treated beverages (orange juice treated with 4000 ppm) resulting in no observed effects.

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12. Ecological Information

Ecological Data for Dimethyl Dicarbonate

Biodegradation

> 90 %,

Acute and Prolonged Toxicity to Fish

LC0: 50 mg/l (Golden orfe (*Leuciscus idus*), 48 hrs)

Toxicity to Microorganisms

EC50: > 40 mg/l, (*Pseudomonas putida*)

EC0: < 40 mg/l, (*Pseudomonas putida*)

13. Disposal considerations

Waste Disposal Method

Waste disposal should be in accordance with existing federal, state, provincial, and/or local environmental control laws.

Empty Container Precautions

Recondition or dispose of empty container in accordance with governmental regulations. Do not reuse empty container without proper cleaning. Label precautions also apply to this container when empty. Empty containers retain product residue (dust, liquid, vapor and/or gases) and can be dangerous. Remove empty bottle from automatic metering system to a well-ventilated area (outdoors is also suitable). Fill bottle carefully with water to the brim so as to avoid overflow. Do not tighten the screw lid back on the container due to possible pressurization from evolution of carbon dioxide. After 24 hours of standing, the water containing the hydrolyzed products of the residual amount of Velcorin can be added to the plant's waste water. The bottle may then be disposed of like any other glass container. Soiled empty containers are to be treated in the same manner.

14. Transportation information

Land transport (DOT)

Proper Shipping Name:	Toxic liquids, corrosive, organic, n.o.s. (contains Dicarmonic acid, dimethyl ester)
Hazard Class or Division:	6.1
UN/NA Number:	UN2927
Packaging Group:	II
Hazard Label(s):	Toxic, Corrosive

Sea transport (IMDG)

Proper Shipping Name:	TOXIC LIQUID, CORROSIVE, ORGANIC, N.O.S. (contains Dicarmonic acid, dimethyl ester)
Hazard Class or Division:	6.1
UN-No:	UN2927
Packaging Group:	II
Hazard Label(s):	Toxic, Corrosive

Air transport (ICAO/IATA)

Proper Shipping Name: Toxic liquid, corrosive, organic, n.o.s. (contains Dicarmonic acid, dimethyl ester)
Hazard Class or Division: 6.1
UN-No: UN2927
Packaging Group: II
Hazard Label(s): Toxic, Corrosive

Additional Transportation Information

49CFR: The U.S. Department of Transportation (DOT) 49 CFR regulations permit the utilization of subsidiary (secondary) hazard shipping paper entries, labeling and placarding. Refer to 49 CFR 172.202 (a) (2), 172.402 (a) (2) and 172.505 (d) for additional information.

15. Regulatory Information

United States Federal Regulations

OSHA Hazcom Standard Rating: Hazardous

US. Toxic Substances Control Act: This product is excluded from TSCA regulation by Section 3 (2)(B)(vi) when used for FDA application.

US. EPA CERCLA Hazardous Substances (40 CFR 302):

Components

None

SARA Section 311/312 Hazard Categories:

Acute Health Hazard

US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title III Section 302 Extremely Hazardous Substance (40 CFR 355, Appendix A):

Components

None

US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title III Section 313 Toxic Chemicals (40 CFR 372.65) - Supplier Notification Required:

Components

None

US. EPA Resource Conservation and Recovery Act (RCRA) Composite List of Hazardous Wastes and Appendix VIII Hazardous Constituents (40 CFR 261):

If discarded in its purchased form, this product would not be a hazardous waste either by listing or by characteristic. However, under RCRA, it is the responsibility of the product user to determine at the time of disposal, whether a material containing the product or derived from the product should be classified as a hazardous waste. (40 CFR 261.20-24)

State Right-To-Know Information

The following chemicals are specifically listed by individual states; other product specific health and safety data in other sections of the MSDS may also be applicable for state requirements. For details on your regulatory requirements you should contact the appropriate agency in your state.

Massachusetts, New Jersey or Pennsylvania Right to Know Substance Lists:

<u>Weight %</u>	<u>Components</u>	<u>CAS-No.</u>
100%	Dimethyl Dicarbonate	4525-33-1

California Prop. 65:

To the best of our knowledge, this product does not contain any of the listed chemicals, which the state of California has found to cause cancer, birth defects or other reproductive harm.

16. Other Information

NFPA 704M Rating

Health	3
Flammability	2
Reactivity	1
Other	

0=Insignificant 1=Slight 2=Moderate 3=High 4=Extreme

HMIS Rating

Health	3
Flammability	2
Physical Hazard	1

0=Minimal 1=Slight 2=Moderate 3=Serious 4=Severe

* = Chronic Health Hazard

LANXESS Corporation's method of hazard communication is comprised of Product Labels and Material Safety Data Sheets. HMIS and NFPA ratings are provided by LANXESS Corporation as a customer service.

Contact Person: Product Safety Department
Telephone: (800) LANXESS
MSDS Number: R304590
Version Date: 06/21/2007
Report Version: 6.2

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