

# DBE

## SOLVENT

### MATERIAL SAFETY DATA SHEET

24

6022CR DBE-3  
Revised 10-APR-1996 Printed 10-APR-1996

#### CHEMICAL PRODUCT/COMPANY IDENTIFICATION

##### Material Identification

Corporate MSDS Number : DU005939  
Formula :  $\text{CH}_3\text{OOC}(\text{CH}_2)_n\text{COOCH}_3$ ,  $n=2,3$  and  $4$   
Molecular Weight : Avg. 173

##### Tradenames and Synonyms

DIBASIC ESTER-3  
DIMETHYL ADIPATE  
HEXANEDIOIC ACID, DIMETHYL ESTER

##### Company Identification

MANUFACTURER/DISTRIBUTOR  
DuPont  
1007 Market Street  
Wilmington, DE 19898

##### PHONE NUMBERS

Product Information : 1-800-231-0998  
Transport Emergency : CHEMTREC: 1-800-424-9300  
Medical Emergency : 1-800-441-3637

#### COMPOSITION/INFORMATION ON INGREDIENTS

##### Components

Material	CAS Number	%
DIMETHYL ADIPATE	627-93-0	85-95
DIMETHYL GLUTARATE	1119-40-0	5-15



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HAZARDS IDENTIFICATION

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## Potential Health Effects

DBE-3 may irritate skin, eyes, nose and throat. May cause blurry vision.

## HUMAN HEALTH EFFECTS:

Skin contact may cause skin irritation with discomfort or rash. Eye contact may cause eye irritation with discomfort, tearing, or blurring of vision. Inhalation may cause irritation of the upper respiratory passages, with coughing and discomfort. Some individuals who have been overexposed by inhalation or skin contact experienced blurry vision.

The mechanism of blurred vision in humans is unknown. Based on observed effects from animal studies, we believe that some symptoms of pre-existing eye disease could be aggravated by overexposure to this material.

## Carcinogenicity Information

None of the components present in this material at concentrations equal to or greater than 0.1% are listed by IARC, NTP, OSHA or ACGIH as a carcinogen.

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FIRST AID MEASURES

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## First Aid

## INHALATION

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

## SKIN CONTACT

Flush skin with water after contact. Wash contaminated clothing before reuse.

## EYE CONTACT

In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Call a physician.

## INGESTION

If swallowed, do not induce vomiting. Immediately give 2 glasses of water. Never give anything by mouth to an unconscious person. Call a physician.

## (FIRST AID MEASURES - Continued)

## Notes to Physicians

Activated charcoal mixture may be beneficial. Suspend 50 g activated charcoal in 400 mL water and mix well. Administer 5 mL/kg, or 350 mL for an average adult.

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FIRE FIGHTING MEASURES  
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## Flammable Properties

Flash Point : 102 C (216 F)  
Method : TCC  
Flammable limits in Air, % by Volume  
LEL : 0.8  
UEL : 8.1  
Autoignition : 360 C (680 F)

Actual Autoignition Temperature (AIT) can be affected by the concentration of vapors and oxygen, vapor/air contact time, pressure, volume, catalytic impurities, etc. Process conditions should be analyzed to determine if the AIT's may be higher or lower.

Vapor forms explosive mixture with air. Hazardous gases/vapors produced in fire are carbon monoxide.

## Extinguishing Media

Water Spray, Foam, Dry Chemical, CO2.

## Fire Fighting Instructions

Keep personnel removed and upwind of fire. Wear self-contained breathing apparatus. Wear full protective equipment. Cool tank/container with water spray.

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ACCIDENTAL RELEASE MEASURES  
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## Safeguards (Personnel)

NOTE: Review FIRE FIGHTING MEASURES and HANDLING (PERSONNEL) sections before proceeding with clean-up. Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean-up.

## Initial Containment

Remove source of heat, sparks, flame, impact, friction or electricity. Dike spill. Prevent material from entering sewers, waterways, or low areas.

## (ACCIDENTAL RELEASE MEASURES - Continued)

## Spill Clean Up

Recover free liquid for reuse or reclamation. Recover undamaged and minimally contaminated material for reuse and reclamation. Soak up with sawdust, sand, oil dry or other absorbent material.

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HANDLING AND STORAGE  
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## Handling (Personnel)

Avoid breathing vapors or mist. Avoid contact with eyes, skin or clothing. Wash thoroughly after handling.

## Storage

Do not mix with strong oxidants, acids, or alkalies. Store in a well ventilated place. Keep container tightly closed.

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EXPOSURE CONTROLS/PERSONAL PROTECTION  
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## Engineering Controls

Use sufficient ventilation to keep employee exposure below recommended limits.

## Personal Protective Equipment

## EYE/FACE PROTECTION

Wear safety glasses. Wear coverall chemical splash goggles when possibility exists for eye and face contact due to splashing or spraying material.

## RESPIRATOR

A NIOSH/MSHA approved air purifying respirator with an organic vapor cartridge or canister may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits. Protection provided by air-purifying respirators is limited. Use a positive pressure air-supplied respirator if there is any potential for an uncontrolled release, exposure levels are not known, or any other circumstances where air-purifying respirators may not provide adequate protection.

## PROTECTIVE CLOTHING

Wear impervious clothing, such as gloves, apron, boots, or whole bodysuit as appropriate.

Recommended glove and clothing material: Butyl Rubber.



## (EXPOSURE CONTROLS/PERSONAL PROTECTION - Continued)

## Exposure Guidelines

## Exposure Limits

DBE-3  
PEL (OSHA) : None Established  
TLV (ACGIH) : None Established  
AEL \* (DuPont) : 1.5 ppm, 10 mg/m<sup>3</sup>, 8 Hr. TWA  
This limit is for DBE.

\* AEL is DuPont's Acceptable Exposure Limit. Where governmentally imposed occupational exposure limits which are lower than the AEL are in effect, such limits shall take precedence.

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PHYSICAL AND CHEMICAL PROPERTIES  
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## Physical Data

Boiling Point : 215-225 C (419-437 F)  
Vapor Pressure : 0.06 mm Hg @ 20 C (68 F)  
Melting Point : 8 C (46 F)  
% Volatiles : 100 WT% @ 20 C (68 F)  
Evaporation Rate : <0.1 (Butyl Acetate=1.0)  
Solubility in Water : 2.5 WT% @ 20 C (68 F)  
Odor : Sweet  
Form : Liquid  
Color : Colorless  
Specific Gravity : 1.068 @ 20 C (68 F)

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STABILITY AND REACTIVITY  
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## Chemical Stability

Stable.

## Incompatibility with Other Materials

Incompatible or can react with strong oxidizers, acids, alkalies.

## Decomposition

Decomposes with heat.

## Polymerization

Polymerization will not occur.

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TOXICOLOGICAL INFORMATION  
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## Animal Data

The information below is based on toxicity testing of a DBE mixture of dimethyl glutarate (66%), dimethyl adipate (17%), and dimethyl succinate (17%), and may be applicable to DBE-3.

## DIBASIC ESTERS MIXTURE (DBE)

Inhalation 4-hour LC50: >11 mg/L in rats  
Inhalation 1-hour LC50: >10.7 mg/L in rats  
Skin absorption LD50 : >2,250 mg/kg in rabbits  
Oral LD50 : 8,191 mg/kg in rats

The mixture is a mild to severe skin irritant and a moderate eye irritant, but is not a skin sensitizer in animals. Toxic effects described in animals from exposure by inhalation include upper respiratory tract irritation. A single 4-hour exposure to 60 ppm caused transient corneal opacity and transient increases in the distance from the cornea to the anterior surface of the lens of the eye. Toxicity described in animals from repeated exposure by inhalation include decreased weight gain, absolute and relative liver weight decrease, and degeneration of olfactory epithelium (nasal tissue). Toxicity described in animals from repeated exposure by ingestion include weight loss, but there were no pathological abnormalities noted.

A single application of 10 uL to the eye caused corneal opacity. The administration of 10-100 uL of a similar mixture caused corneal opacity, transient increases in corneal thickness, and transient corneal anesthesia. A single application of approximately 60 mg/kg to the skin caused transient increases in the distance from the cornea to the anterior surface of the lens of the eye.

The mixture does not produce genetic damage in animals, or in bacterial cell cultures, but it was positive in one study with cultured mammalian cells. Animal testing indicates that this mixture does not have developmental, or reproductive effects.

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ECOLOGICAL INFORMATION  
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## Ecotoxicological Information

## AQUATIC TOXICITY:

## DBE

96 hour LC50 - Fathead minnows: 18-24 mg/L.  
Moderately toxic.

48 hour LC50 - Daphnia magna: 112-150 mg/L

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DISPOSAL CONSIDERATIONS  
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## Waste Disposal

Treatment, storage, transportation, and disposal must be in accordance with applicable Federal, State/Provincial, and Local regulations. Recover nonusable free liquid and dispose of in approved and permitted incinerator. Recover nonusable free liquid and dispose of in approved and permitted biological treatment system. Recover contaminated water and dispose of in approved and permitted biological treatment system. Remove nonusable solid material and/or contaminated soil, for disposal in an approved and permitted landfill. Do not flush to surface water or sanitary sewer system.

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TRANSPORTATION INFORMATION  
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## Shipping Information

NOT REGULATED AS A HAZARDOUS MATERIAL BY DOT, IMO, OR IATA.

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REGULATORY INFORMATION  
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## # U.S. Federal Regulations

TSCA Inventory Status : Reported/Included.

TITLE III HAZARD CLASSIFICATIONS SECTIONS 311, 312

Acute : Yes  
Chronic : No  
Fire : No  
Reactivity : No  
Pressure : No

## HAZARDOUS CHEMICAL LISTS

SARA Extremely Hazardous Substance: No  
CERCLA Hazardous Substance : No

## (REGULATORY INFORMATION - Continued)

SARA Toxic Chemical : No

VOC's for DBE-3 per the EPA Federal Register/Volume 57,  
No. 22/, 2/3/92/Page 3945, considered to be 100% VOC  
(1066 gr/ltr).

## Canadian Regulations

CLASS D Division 2 Subdivision B - Toxic Material. Skin or Eye  
Irritant.

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OTHER INFORMATION  
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## NFPA, NPCA-HMIS

NPCA-HMIS Rating  
Health : 1  
Flammability : 1  
Reactivity : 0

Personal Protection rating to be supplied by user depending on use  
conditions.

## Additional Information

The hydrogen cyanide concentration in this product is so low (<10  
ppm) as to be toxicologically insignificant when this product is  
used as a solvent. However, when this product is chemically  
reacted with alcohols, and methanol is recovered from that  
reaction and purified for reuse by distillation, concentration of  
highly volatile impurities such as hydrogen cyanide to  
toxicologically significant levels can occur in the waste stream  
from this process. Processors using this product as a raw  
material should be aware of this potential hazard.

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The data in this Material Safety Data Sheet relates only to the  
specific material designated herein and does not relate to use in  
combination with any other material or in any process.

Responsibility for MSDS : DuPont Chemicals  
Address : Engineering & Product Safety  
> : P.O. Box 80709, Chestnut Run  
> : Wilmington, DE 19880-0709  
Telephone : (302) 999-4946

# Indicates updated section.

End of MSDS