

EPIBOND® 1544-1 A-82 US

Version 1.1 Revision Date: 08/16/2022 SDS Number: 400001013542 Date of last issue: 01/17/2017
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Print Date 02/23/2024

SECTION 1. IDENTIFICATION

Product name : EPIBOND® 1544-1 A-82 US

Manufacturer or supplier's details

Company name of supplier : Huntsman Advanced Materials Americas LLC
Address : P.O. Box 4980
The Woodlands,
TX 77387
United States of America (USA)
Telephone : Non-Emergency: (800) 257-5547
E-mail address : Global_Product_EHS_AdMat@huntsman.com
Emergency telephone number : Chemtrec: (800) 424-9300 or (703) 527-3887

Recommended use of the chemical and restrictions on use

Recommended use : Adhesives

SECTION 2. HAZARDS IDENTIFICATION**GHS classification in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200)**

Skin irritation : Category 2
Eye irritation : Category 2A
Skin sensitisation : Category 1
Reproductive toxicity : Category 2
Short-term (acute) aquatic hazard : Category 2
Long-term (chronic) aquatic hazard : Category 2

GHS label elementsHazard pictograms : 

Signal word : Warning

Hazard statements : H315 Causes skin irritation.
H317 May cause an allergic skin reaction.
H319 Causes serious eye irritation.
H361fd Suspected of damaging fertility. Suspected of damaging

**EPIBOND® 1544-1 A-82 US**

Version	Revision Date:	SDS Number:	Date of last issue:
1.1	08/16/2022	400001013542	01/17/2017
			Date of first issue: 01/17/2017

Print Date 02/23/2024

the unborn child.

H411 Toxic to aquatic life with long lasting effects.

Precautionary statements

: **Prevention:**

P201 Obtain special instructions before use.

P202 Do not handle until all safety precautions have been read and understood.

P261 Avoid breathing mist or vapours.

P264 Wash skin thoroughly after handling.

P272 Contaminated work clothing must not be allowed out of the workplace.

P273 Avoid release to the environment.

P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response:

P302 + P352 IF ON SKIN: Wash with plenty of soap and water.

P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P308 + P313 IF exposed or concerned: Get medical advice/ attention.

P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention.

P337 + P313 If eye irritation persists: Get medical advice/ attention.

P362 Take off contaminated clothing and wash before reuse.

P391 Collect spillage.

Storage:

P405 Store locked up.

Disposal:

P501 Dispose of contents/container to an approved facility in accordance with local, regional, national and international regulations.

Other hazards

None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Hazardous components

Chemical name	CAS-No.	Concentration (% w/w)
2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane	1675-54-3	50 - 70
1-isopropyl-2,2-dimethyltrimethylene diisobutyrate	6846-50-0	10 - 20
bis(1,2,2,6,6-pentamethyl-4-piperidyl) sebacate	41556-26-7	0.1 - 1
melamine	108-78-1	0.1 - 1

EPIBOND® 1544-1 A-82 US

Version	Revision Date:	SDS Number:	Date of last issue: 01/17/2017
1.1	08/16/2022	400001013542	Date of first issue: 01/17/2017

Print Date 02/23/2024

methyl 1,2,2,6,6-pentamethyl-4-piperidyl sebacate	82919-37-7	0.1 - 1
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The specific chemical identity and/or exact percentage (concentration) of composition may be withheld as a trade secret.

Both 25068-38-6 and 1675-54-3 can be used to describe the epoxy resin which is produced through the reaction of bisphenol A and epichlorohydrin

SECTION 4. FIRST AID MEASURES

- | | | |
|---|---|---|
| General advice | : | Move out of dangerous area.
Consult a physician.
Show this safety data sheet to the doctor in attendance.
Treat symptomatically.
Get medical attention if symptoms occur. |
| If inhaled | : | If inhaled, remove to fresh air.
Get medical attention if symptoms occur. |
| In case of skin contact | : | If skin irritation persists, call a physician.
If on skin, rinse well with water.
If on clothes, remove clothes. |
| In case of eye contact | : | Immediately flush eye(s) with plenty of water.
Remove contact lenses.
Keep eye wide open while rinsing.
If eye irritation persists, consult a specialist. |
| If swallowed | : | Induce vomiting immediately and call a physician.
Keep respiratory tract clear.
Never give anything by mouth to an unconscious person.
If symptoms persist, call a physician.
Take victim immediately to hospital. |
| Most important symptoms and effects, both acute and delayed | : | None known. |
| Protection of first-aiders | : | First Aid responders should pay attention to self-protection and use the recommended protective clothing
If potential for exposure exists refer to Section 8 for specific personal protective equipment.
Avoid inhalation, ingestion and contact with skin and eyes.
No action shall be taken involving any personal risk or without suitable training.
It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. |
| Notes to physician | : | Treat symptomatically. |

EPIBOND® 1544-1 A-82 US

Version 1.1 Revision Date: 08/16/2022 SDS Number: 400001013542 Date of last issue: 01/17/2017
Date of first issue: 01/17/2017

Print Date 02/23/2024

SECTION 5. FIREFIGHTING MEASURES

- Suitable extinguishing media : Water spray
Alcohol-resistant foam
Carbon dioxide (CO₂)
Dry chemical
- Unsuitable extinguishing media : Exercise caution when using a high volume water jet as it may scatter and spread fire
- Specific hazards during firefighting : Do not allow run-off from fire fighting to enter drains or water courses.
- Hazardous combustion products : Carbon oxides
Halogenated compounds
- Specific extinguishing methods : Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
- Further information : Collect contaminated fire extinguishing water separately. This must not be discharged into drains.
Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.
- Special protective equipment for firefighters : Wear self-contained breathing apparatus for firefighting if necessary.

SECTION 6. ACCIDENTAL RELEASE MEASURES

- Personal precautions, protective equipment and emergency procedures : Use personal protective equipment.
Refer to protective measures listed in sections 7 and 8.
- Environmental precautions : Prevent product from entering drains.
Prevent further leakage or spillage if safe to do so.
If the product contaminates rivers and lakes or drains inform respective authorities.
- Methods and materials for containment and cleaning up : Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust).
Keep in suitable, closed containers for disposal.

SECTION 7. HANDLING AND STORAGE

- Advice on protection against fire and explosion : Normal measures for preventive fire protection.
- Advice on safe handling : Repeated or prolonged skin contact may cause skin irritation and/or dermatitis and sensitisation of susceptible persons.
Persons suffering from asthma, eczema or skin problems should avoid contact, including dermal contact, with this

EPIBOND® 1544-1 A-82 US

Version	Revision Date:	SDS Number:	Date of last issue: 01/17/2017
1.1	08/16/2022	400001013542	Date of first issue: 01/17/2017

Print Date 02/23/2024

product.
 Do not breathe vapours/dust.
 Avoid exposure - obtain special instructions before use.
 Avoid contact with skin and eyes.
 For personal protection see section 8.
 Smoking, eating and drinking should be prohibited in the application area.
 Dispose of rinse water in accordance with local and national regulations.

- Conditions for safe storage : Keep container tightly closed in a dry and well-ventilated place.
 Containers which are opened must be carefully resealed and kept upright to prevent leakage.
 Observe label precautions.
 Keep in properly labelled containers.
- Materials to avoid : For incompatible materials please refer to Section 10 of this SDS.
- Recommended storage temperature : 36 - 104 °F / 2 - 40 °C
- Further information on storage stability : Stable under normal conditions.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION**Components with workplace control parameters**

Contains no substances with occupational exposure limit values.

Personal protective equipment

- Respiratory protection : General and local exhaust ventilation is recommended to maintain vapor exposures below recommended limits. Where concentrations are above recommended limits or are unknown, appropriate respiratory protection should be worn. Follow OSHA respirator regulations (29 CFR 1910.134) and use NIOSH/MSHA approved respirators. Protection provided by air purifying respirators against exposure to any hazardous chemical is limited. Use a positive pressure air supplied respirator if there is any potential for uncontrolled release, exposure levels are unknown, or any other circumstance where air purifying respirators may not provide adequate protection.
- Respiratory protection : In the case of vapour formation use a respirator with an approved filter.
- Hand protection
- Material : butyl-rubber
- Break through time : > 8 h
- Material : Solvent-resistant gloves (butyl-rubber)
- Material : Nitrile rubber
- Break through time : 10 - 480 min

EPIBOND® 1544-1 A-82 US

Version 1.1 Revision Date: 08/16/2022 SDS Number: 400001013542 Date of last issue: 01/17/2017
Date of first issue: 01/17/2017

Print Date 02/23/2024

Material : Neoprene gloves

Remarks : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.
The suitability for a specific workplace should be discussed with the producers of the protective gloves.

Eye protection : Eye wash bottle with pure water
Tightly fitting safety goggles
Wear face-shield and protective suit for abnormal processing problems.

Skin and body protection : Impervious clothing
Choose body protection according to the amount and concentration of the dangerous substance at the work place.

Hygiene measures : When using do not eat or drink.
When using do not smoke.
Wash hands before breaks and at the end of workday.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance : paste

Colour : grey

Odour : odourless

Odour Threshold : No data is available on the product itself.

pH : No data is available on the product itself.

Melting point/freezing point : No data is available on the product itself.

Boiling point : No data is available on the product itself.

Flash point : > 356 °F / > 180 °C
Method: estimated, closed cup

Evaporation rate : No data is available on the product itself.

Flammability (solid, gas) : No data is available on the product itself.

Flammability (liquids) : No data is available on the product itself.

Upper explosion limit / Upper flammability limit : No data is available on the product itself.

Lower explosion limit / Lower flammability limit : No data is available on the product itself.

Vapour pressure : No data is available on the product itself.

EPIBOND® 1544-1 A-82 US

Version	Revision Date:	SDS Number:	Date of last issue: 01/17/2017
1.1	08/16/2022	400001013542	Date of first issue: 01/17/2017

Print Date 02/23/2024

Relative vapour density : No data is available on the product itself.

Relative density : 1.25

Density : No data is available on the product itself.

Solubility(ies)

Water solubility : No data is available on the product itself.

Solubility in other solvents : No data is available on the product itself.

Partition coefficient: n-octanol/water : No data is available on the product itself.

Auto-ignition temperature : No data is available on the product itself.

Decomposition temperature : No data is available on the product itself.

Self-Accelerating decomposition temperature (SADT) : No data is available on the product itself.

Viscosity : No data is available on the product itself.

Explosive properties : No data is available on the product itself.

Oxidizing properties : No data is available on the product itself.

Particle size : No data is available on the product itself.

SECTION 10. STABILITY AND REACTIVITY

Reactivity : No dangerous reaction known under conditions of normal use.

Chemical stability : Stable under normal conditions.

Possibility of hazardous reactions : No hazards to be specially mentioned.

Conditions to avoid : None known.

Incompatible materials : Strong acids
Strong bases
Strong oxidizing agents

Hazardous decomposition products : carbon dioxide
carbon monoxide
Halogenated compounds

EPIBOND® 1544-1 A-82 US

Version 1.1 Revision Date: 08/16/2022 SDS Number: 400001013542 Date of last issue: 01/17/2017
Date of first issue: 01/17/2017

Print Date 02/23/2024

SECTION 11. TOXICOLOGICAL INFORMATION**Acute toxicity****Product:**

Acute dermal toxicity : Acute toxicity estimate: > 5,000 mg/kg
Method: Calculation method

Components:**2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:**

Acute oral toxicity : LD50 (Rat, female): > 2,000 mg/kg
Method: OECD Test Guideline 420
Assessment: The substance or mixture has no acute oral toxicity
Remarks: No mortality observed at this dose.

Acute dermal toxicity : LD50 (Rat, male and female): > 2,000 mg/kg
Method: OECD Test Guideline 402
Assessment: The substance or mixture has no acute dermal toxicity

1-isopropyl-2,2-dimethyltrimethylene diisobutyrate:

Acute oral toxicity : LD50 (Rat, female): > 2,000 mg/kg
Method: OECD Test Guideline 425
Assessment: The substance or mixture has no acute oral toxicity

Acute inhalation toxicity : LC50 (Rat): > 5.3 mg/l
Exposure time: 6 h
Test atmosphere: vapour

Acute dermal toxicity : LD50 (Rabbit, male and female): > 2,000 mg/kg
Method: OECD Test Guideline 402
Assessment: The substance or mixture has no acute dermal toxicity

bis(1,2,2,6,6-pentamethyl-4-piperidyl) sebacate:

Acute oral toxicity : LD50 (Rat): 2,369 - 3,920 mg/kg

Acute dermal toxicity : LD50 (Rabbit): > 2,000 mg/kg
Assessment: The substance or mixture has no acute dermal toxicity

melamine:

Acute oral toxicity : LD50 (Rat, male and female): 3,161 - 3,828 mg/kg

Acute inhalation toxicity : LC50 (Rat, male and female): > 5190 mg/m³
Exposure time: 4 h
Test atmosphere: dust/mist
Method: OECD Test Guideline 403
Assessment: The substance or mixture has no acute inhalation toxicity

EPIBOND® 1544-1 A-82 US

Version 1.1 Revision Date: 08/16/2022 SDS Number: 400001013542 Date of last issue: 01/17/2017
Date of first issue: 01/17/2017

Print Date 02/23/2024

Skin corrosion/irritation**Components:****2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:**

Species : Rabbit
Exposure time : 4 h
Assessment : Irritating to skin.
Method : OECD Test Guideline 404
Result : Irritating to skin.

1-isopropyl-2,2-dimethyltrimethylene diisobutyrate:

Species : Rabbit
Method : OECD Test Guideline 404
Result : No skin irritation

melamine:

Species : Rabbit
Method : OECD Test Guideline 404
Result : No skin irritation

Serious eye damage/eye irritation**Components:****2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:**

Species : Rabbit
Result : Irritating to eyes.
Assessment : Irritating to eyes.
Method : OECD Test Guideline 405

1-isopropyl-2,2-dimethyltrimethylene diisobutyrate:

Species : Rabbit
Result : No eye irritation
Method : OECD Test Guideline 405

bis(1,2,2,6,6-pentamethyl-4-piperidyl) sebacate:

Species : Rabbit
Result : No eye irritation
Assessment : No eye irritation

melamine:

Species : Rabbit
Remarks : slight irritation

Respiratory or skin sensitisation**Components:****2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:**

Test Type : Local lymph node assay (LLNA)
Exposure routes : Skin

**EPIBOND® 1544-1 A-82 US**

Version	Revision Date:	SDS Number:	Date of last issue: 01/17/2017
1.1	08/16/2022	400001013542	Date of first issue: 01/17/2017

Print Date 02/23/2024

Species : Mouse
 Method : OECD Test Guideline 429
 Result : The product is a skin sensitiser, sub-category 1B.

1-isopropyl-2,2-dimethyltrimethylene diisobutyrate:

Exposure routes : Skin
 Species : Humans
 Result : Does not cause skin sensitisation.

bis(1,2,2,6,6-pentamethyl-4-piperidyl) sebacate:

Exposure routes : Skin
 Species : Guinea pig
 Assessment : Probability or evidence of skin sensitisation in humans

melamine:

Exposure routes : Skin
 Species : Guinea pig
 Method : OECD Test Guideline 406
 Result : Does not cause skin sensitisation.

methyl 1,2,2,6,6-pentamethyl-4-piperidyl sebacate:

Exposure routes : Skin
 Species : Guinea pig
 Assessment : May cause sensitisation by skin contact.
 Result : Causes sensitisation.

Germ cell mutagenicity**Components:****2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:**

Genotoxicity in vitro : Test Type: In vitro mammalian cell gene mutation test
 Test system: mouse lymphoma cells
 Metabolic activation: without metabolic activation
 Result: positive

Test Type: reverse mutation assay
 Test system: Salmonella typhimurium
 Metabolic activation: with and without metabolic activation
 Method: Mutagenicity (Salmonella typhimurium - reverse mutation assay)
 Result: negative

Genotoxicity in vivo : Test Type: in vivo assay
 Species: Mouse (male)
 Cell type: Germ
 Application Route: Oral
 Dose: 3333, 10000 mg/kg
 Result: negative

Test Type: gene mutation test
 Species: Rat (male)
 Cell type: Somatic

EPIBOND® 1544-1 A-82 US

Version	Revision Date:	SDS Number:	Date of last issue: 01/17/2017
1.1	08/16/2022	400001013542	Date of first issue: 01/17/2017

Print Date 02/23/2024

Application Route: Oral
 Dose: 50,250,500,1000 mg/kg bw/day
 Method: OECD Test Guideline 488
 Result: negative

1-isopropyl-2,2-dimethyltrimethylene diisobutyrate:

Genotoxicity in vitro : Metabolic activation: with and without metabolic activation
 Method: OECD Test Guideline 473
 Result: negative

Concentration: 100 - 5000 ug/plate
 Metabolic activation: with and without metabolic activation
 Method: Directive 67/548/EEC, Annex, B.13/14
 Result: negative

Test Type: In vitro mammalian cell gene mutation test
 Test system: Chinese hamster ovary cells
 Method: OECD Test Guideline 476
 Result: negative

bis(1,2,2,6,6-pentamethyl-4-piperidyl) sebacate:

Genotoxicity in vitro : Metabolic activation: with and without metabolic activation
 Method: OECD Test Guideline 471
 Result: negative

melamine:

Genotoxicity in vitro : Metabolic activation: with and without metabolic activation
 Method: Chromosome aberration test in vitro
 Result: negative

Metabolic activation: with and without metabolic activation
 Method: In vitro mammalian cell gene mutation test
 Result: negative

Genotoxicity in vivo : Application Route: Intraperitoneal injection
 Method: Skin Sensitization
 Result: negative

Carcinogenicity**Components:****2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:**

Species : Rat, male
 Application Route : Oral
 Exposure time : 24 month(s)
 Dose : 0, 2, 15, or 100 mg/kg bw/day
 Frequency of Treatment : 7 days/week
 NOAEL : 15 mg/kg bw/day
 Method : OECD Test Guideline 453
 Result : negative
 Target Organs : Digestive organs

Species : Mouse, male

**EPIBOND® 1544-1 A-82 US**

Version	Revision Date:	SDS Number:	Date of last issue: 01/17/2017
1.1	08/16/2022	400001013542	Date of first issue: 01/17/2017

Print Date 02/23/2024

Application Route : Dermal
 Exposure time : 24 month(s)
 Dose : 0, 0.1, 10, 100 mg/kg bw/day
 Frequency of Treatment : 3 days/week
 NOEL : 0.1 mg/kg body weight
 Method : OECD Test Guideline 453
 Result : negative
 Target Organs : Digestive organs

Species : Rat, female
 Application Route : Dermal
 Exposure time : 24 month(s)
 Dose : 0.1, 100, 1000 mg/kg bw/day
 Frequency of Treatment : 5 days/week
 NOEL : 100 mg/kg body weight
 Method : OECD Test Guideline 453
 Result : negative

Species : Rat, female
 Application Route : Oral
 Exposure time : 24 month(s)
 Dose : 0, 2, 15, or 100 mg/kg bw/day
 Frequency of Treatment : 7 days/week
 NOAEL : 100 mg/kg bw/day
 Method : OECD Test Guideline 453
 Result : negative
 Target Organs : Digestive organs

Species : Rat, females
 Application Route : Oral
 Exposure time : 24 month(s)
 Dose : 0, 2, 15, or 100 mg/kg bw/day
 Frequency of Treatment : 7 days/week
 NOEL : 2 mg/kg bw/day
 Method : OECD Test Guideline 453
 Result : negative
 Target Organs : Digestive organs

IARC Group 2B: Possibly carcinogenic to humans
 melamine 108-78-1

OSHA No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

NTP No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

Reproductive toxicity**Components:****2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:**

Effects on fertility : Test Type: Two-generation study
 Species: Rat, male and female
 Application Route: Oral
 Dose: 0, 50, 180, 540 or 750 milligram per kilogram

EPIBOND® 1544-1 A-82 US

Version	Revision Date:	SDS Number:	Date of last issue: 01/17/2017
1.1	08/16/2022	400001013542	Date of first issue: 01/17/2017

Print Date 02/23/2024

Duration of Single Treatment: 238 d
 Frequency of Treatment: 1 daily
 General Toxicity - Parent: NOEL: 540 mg/kg body weight
 General Toxicity F1: NOEL: 750 mg/kg body weight
 Symptoms: No adverse effects
 Method: OECD Test Guideline 416
 Result: No effects on fertility and early embryonic development were detected.

Effects on foetal development

: Species: Rabbit, female
 Application Route: Dermal
 Dose: 0, 30, 100 or 300 milligram per kilogram
 Duration of Single Treatment: 28 d
 Frequency of Treatment: 1 daily
 General Toxicity Maternal: NOAEL: 30 mg/kg body weight
 Developmental Toxicity: NOAEL: 300 mg/kg body weight
 Method: Other guidelines
 Result: No teratogenic effects

Test Type: Pre-natal
 Species: Rabbit, female
 Application Route: Oral
 Dose: 0, 20, 60 or 180 milligram per kilogram
 Duration of Single Treatment: 13 d
 Frequency of Treatment: 1 daily
 General Toxicity Maternal: NOAEL: 60 mg/kg body weight
 Developmental Toxicity: NOAEL: 180 mg/kg body weight
 Method: OECD Test Guideline 414
 Result: No teratogenic effects

Test Type: Pre-natal
 Species: Rat, female
 Application Route: Oral
 Dose: 0, 60, 180 and 540 milligram per kilogram
 Duration of Single Treatment: 10 d
 Frequency of Treatment: 1 daily
 General Toxicity Maternal: NOAEL: 180 mg/kg body weight
 Developmental Toxicity: NOAEL: > 540 mg/kg body weight
 Method: OECD Test Guideline 414
 Result: No teratogenic effects

1-isopropyl-2,2-dimethyltrimethylene diisobutyrate:

Effects on fertility

: Species: Rat, male and female
 Application Route: Oral
 Method: OECD Test Guideline 421

Species: Rat, male and female
 Application Route: Oral
 Method: OECD Test Guideline 422
 Result: Animal testing did not show any effects on fertility.

Effects on foetal development

: Species: Rat, females
 Application Route: Oral
 General Toxicity Maternal: NOAEL: 343 mg/kg body weight
 Developmental Toxicity: NOAEL: 343 mg/kg body weight
 Method: OECD Test Guideline 414

EPIBOND® 1544-1 A-82 US

Version	Revision Date:	SDS Number:	Date of last issue: 01/17/2017
1.1	08/16/2022	400001013542	Date of first issue: 01/17/2017

Print Date 02/23/2024

Reproductive toxicity - Assessment : Some evidence of adverse effects on development, based on animal experiments.

bis(1,2,2,6,6-pentamethyl-4-piperidyl) sebacate:

Reproductive toxicity - Assessment : Some evidence of adverse effects on sexual function and fertility, based on animal experiments.

melamine:

Effects on foetal development : Species: Rat, female
 Application Route: Oral
 General Toxicity Maternal: NOAEL: 600 mg/kg body weight
 Method: OECD Test Guideline 414
 Result: No teratogenic effects

methyl 1,2,2,6,6-pentamethyl-4-piperidyl sebacate:

Reproductive toxicity - Assessment : Some evidence of adverse effects on sexual function and fertility, based on animal experiments.

STOT - single exposure

No data available

STOT - repeated exposure

No data available

Repeated dose toxicity**Components:****2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:**

Species : Rat, male and female
 NOAEL : 50 mg/kg
 Application Route : oral (gavage)
 Exposure time : 14 Weeks
 Number of exposures : 7 d
 Dose : 0, 50, 250, 1000 mg/kg/day
 Method : OECD Test Guideline 408

Species : Rat, male and female
 NOAEL : >= 10 mg/kg
 Application Route : Skin contact
 Exposure time : 13 Weeks
 Number of exposures : 5 d
 Dose : 0, 10, 100, 1000 mg/kg/day
 Method : OECD Test Guideline 411

Species : Mouse, male
 NOAEL : 100 mg/kg
 Application Route : Skin contact
 Exposure time : 13 Weeks
 Number of exposures : 3 d
 Dose : 0, 1, 10, 100 mg/kg/day
 Method : OECD Test Guideline 411

EPIBOND® 1544-1 A-82 US

Version	Revision Date:	SDS Number:	Date of last issue: 01/17/2017
1.1	08/16/2022	400001013542	Date of first issue: 01/17/2017

Print Date 02/23/2024

1-isopropyl-2,2-dimethyltrimethylene diisobutyrate:

Species	:	Rat, male and female
NOAEL	:	150 - 750 mg/kg/d
Application Route	:	Ingestion
Exposure time	:	13 Weeks
Number of exposures	:	7 d
Method	:	Subchronic toxicity

Species	:	Rat, male and female
NOEL	:	30 mg/kg
Application Route	:	Ingestion
Number of exposures	:	7 d
Method	:	Subchronic toxicity

melamine:

Species	:	Rat, male and female
LOAEL	:	72 mg/kg
Application Route	:	Ingestion
Exposure time	:	13 Weeks
Method	:	Subchronic toxicity

Aspiration toxicity

No data available

Experience with human exposure

No data available

Toxicology, Metabolism, Distribution

No data available

Neurological effects

No data available

Further information

No data available

SECTION 12. ECOLOGICAL INFORMATION**Ecotoxicity****Components:****2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:**

Toxicity to fish	:	LC50 (Oncorhynchus mykiss (rainbow trout)): 2 mg/l Exposure time: 96 h Method: OECD Test Guideline 203
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Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): 1.8 mg/l Exposure time: 48 h Test Type: static test Test substance: Fresh water Method: OECD Test Guideline 202
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Toxicity to algae/aquatic plants	:	EC50: 11 mg/l Exposure time: 72 h Test Type: static test
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EPIBOND® 1544-1 A-82 US

Version 1.1 Revision Date: 08/16/2022 SDS Number: 400001013542 Date of last issue: 01/17/2017
Date of first issue: 01/17/2017

Print Date 02/23/2024

Test substance: Fresh water
Method: EPA-660/3-75-009

NOEC: 4.2 mg/l
Exposure time: 72 h
Test Type: static test
Test substance: Fresh water
Method: EPA-660/3-75-009

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (Daphnia magna (Water flea)): 0.3 mg/l
Exposure time: 21 d
Test Type: semi-static test
Test substance: Fresh water
Method: OECD Test Guideline 211

Toxicity to microorganisms : IC50 (activated sludge): > 100 mg/l
Exposure time: 3 h
Test Type: static test
Test substance: Fresh water

Ecotoxicology Assessment

Chronic aquatic toxicity : Toxic to aquatic life with long lasting effects.

1-isopropyl-2,2-dimethyltrimethylene diisobutyrate:

Toxicity to fish : EC50 (Lepomis macrochirus (Bluegill sunfish)): \geq 6 mg/l
Exposure time: 96 h
Test Type: flow-through test
Test substance: Fresh water
Method: OECD Test Guideline 203
Remarks: No-observed-effect level

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): > 1.46 mg/l
Exposure time: 48 h
Test Type: static test
Test substance: Fresh water
Remarks: Aquatic toxicity is unlikely due to low solubility.

Toxicity to algae/aquatic plants : ErC50 (Selenastrum capricornutum (green algae)): > 7.49 mg/l
Exposure time: 72 h
Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 201
Remarks: Aquatic toxicity is unlikely due to low solubility.

Toxicity to fish (Chronic toxicity) : GLP: yes

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (Daphnia magna (Water flea)): 0.7 mg/l
Exposure time: 21 d
Test Type: flow-through test
Test substance: Fresh water
Method: OECD Test Guideline 211
Remarks: Aquatic toxicity is unlikely due to low solubility.

EPIBOND® 1544-1 A-82 US

Version	Revision Date:	SDS Number:	Date of last issue: 01/17/2017
1.1	08/16/2022	400001013542	Date of first issue: 01/17/2017

Print Date 02/23/2024

EC50 (Daphnia magna (Water flea)): >= 1.3 mg/l
 Exposure time: 21 d
 Test Type: flow-through test
 Test substance: Fresh water

Ecotoxicology Assessment

Chronic aquatic toxicity : Harmful to aquatic life with long lasting effects.

bis(1,2,2,6,6-pentamethyl-4-piperidyl) sebacate:

Toxicity to fish : LC50 (Lepomis macrochirus (Bluegill sunfish)): 0.97 - 1 mg/l
 Exposure time: 96 h
 Test substance: Fresh water
 Method: OECD Test Guideline 203

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 20 mg/l
 Exposure time: 24 h
 Test substance: Fresh water
 Method: OECD Test Guideline 202

M-Factor (Acute aquatic toxicity) : 1

M-Factor (Chronic aquatic toxicity) : 1

Toxicity to microorganisms : EC50 (activated sludge): > 100 mg/l
 Exposure time: 3 h
 Method: OECD Test Guideline 209

melamine:

Toxicity to fish : LC50 (Oncorhynchus mykiss (rainbow trout)): > 3,000 mg/l
 Exposure time: 96 h
 Test Type: semi-static test
 Test substance: Fresh water

Toxicity to daphnia and other aquatic invertebrates : LC50 (Daphnia magna (Water flea)): > 1,000 mg/l
 Exposure time: 48 h
 Test Type: static test
 Test substance: Fresh water
 Method: Aquatic Invertebrate Acute Toxicity Test, Freshwater Daphnids

Toxicity to algae/aquatic plants : EC50 (Selenastrum capricornutum (green algae)): 325 mg/l
 Exposure time: 96 h
 Test Type: static test
 Test substance: Fresh water

Toxicity to fish (Chronic toxicity) : NOEC (Oncorhynchus mykiss (rainbow trout)): 1,500 mg/l
 Exposure time: 28 d
 Test Type: semi-static test
 Test substance: Fresh water

Toxicity to daphnia and other aquatic invertebrates : NOEC (Daphnia magna (Water flea)): 18 mg/l
 Exposure time: 21 d

EPIBOND® 1544-1 A-82 US

Version	Revision Date:	SDS Number:	Date of last issue: 01/17/2017
1.1	08/16/2022	400001013542	Date of first issue: 01/17/2017

Print Date 02/23/2024

(Chronic toxicity) Test Type: semi-static test
Test substance: Fresh water

methyl 1,2,2,6,6-pentamethyl-4-piperidyl sebacate:

M-Factor (Acute aquatic toxicity) : 1

Ecotoxicology Assessment

Acute aquatic toxicity : Very toxic to aquatic life.

Chronic aquatic toxicity : Very toxic to aquatic life with long lasting effects.

Persistence and degradability**Components:****2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:**

Biodegradability : aerobic
Inoculum: activated sludge, non-adapted
Concentration: 20 mg/l
Result: Not readily biodegradable.
Biodegradation: 5 %
Exposure time: 28 d
Method: OECD Test Guideline 301F

Stability in water : Degradation half life (DT50): 4.83 d (25 °C) pH: 4
Method: OECD Test Guideline 111
Remarks: Fresh water

Degradation half life (DT50): 7.1 d (25 °C) pH: 9
Method: OECD Test Guideline 111
Remarks: Fresh water

Degradation half life (DT50): 3.58 d (25 °C) pH: 7
Method: OECD Test Guideline 111
Remarks: Fresh water

1-isopropyl-2,2-dimethyltrimethylene diisobutyrate:

Biodegradability : Inoculum: activated sludge
Concentration: 10 mg/l
Result: Readily biodegradable.
Biodegradation: 70.73 %
Exposure time: 28 d
Method: OECD Test Guideline 310

Stability in water : Degradation half life (DT50): 1.48 - 14.75 yr (20 °C) pH: 7.5
Method: No information available.

bis(1,2,2,6,6-pentamethyl-4-piperidyl) sebacate:

Biodegradability : Inoculum: Domestic sewage
Concentration: 20 mg/l
Result: Not biodegradable
Biodegradation: 38 %

EPIBOND® 1544-1 A-82 US

Version	Revision Date:	SDS Number:	Date of last issue: 01/17/2017
1.1	08/16/2022	400001013542	Date of first issue: 01/17/2017

Print Date 02/23/2024

Exposure time: 28 d
Method: OECD Test Guideline 301E

Stability in water : Degradation half life (DT50): > 182 d pH: 8
Remarks: Fresh water

melamine:

Biodegradability : Inoculum: activated sludge
Concentration: 100 mg/l
Result: Not readily biodegradable.
Biodegradation: < 10 %
Exposure time: 28 d
Method: OECD Test Guideline 302B

methyl 1,2,2,6,6-pentamethyl-4-piperidyl sebacate:

Stability in water : Degradation half life (DT50): > 182 d pH: 8
Remarks: Fresh water

Bioaccumulative potential**Components:****2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:**

Bioaccumulation : Bioconcentration factor (BCF): 31
Remarks: Does not bioaccumulate.

Partition coefficient: n-octanol/water : log Pow: 3.242 (77 °F / 25 °C)
pH: 7.1
Method: OECD Test Guideline 117

1-isopropyl-2,2-dimethyltrimethylene diisobutyrate:

Bioaccumulation : Species: Lepomis macrochirus (Bluegill sunfish)
Bioconcentration factor (BCF): 1.95
Exposure time: 23 d
Test substance: Fresh water
Method: flow-through test
Remarks: Bioaccumulation is unlikely.

Partition coefficient: n-octanol/water : log Pow: 4.04 - 4.91 (77 °F / 25 °C)
pH: 7

bis(1,2,2,6,6-pentamethyl-4-piperidyl) sebacate:

Bioaccumulation : Species: Fish
Remarks: Bioaccumulation is unlikely.

Species: Fish
Bioconcentration factor (BCF): 75.39
Remarks: Bioaccumulation is unlikely.

Partition coefficient: n-octanol/water : log Pow: 0.37
Method: OECD Test Guideline 107

melamine:

EPIBOND® 1544-1 A-82 US

Version	Revision Date:	SDS Number:	Date of last issue:
1.1	08/16/2022	400001013542	01/17/2017
			Date of first issue: 01/17/2017

Print Date 02/23/2024

Bioaccumulation : Bioconcentration factor (BCF): 0.05

Partition coefficient: n-octanol/water : log Pow: -1.22 (68 °F / 20 °C)
pH: 8
Method: Partition coefficient**methyl 1,2,2,6,6-pentamethyl-4-piperidyl sebacate:**Bioaccumulation : Species: Fish
Remarks: Bioaccumulation is unlikely.Species: Fish
Bioconcentration factor (BCF): 75.39
Remarks: Bioaccumulation is unlikely.**Mobility in soil****Components:****2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:**

Distribution among environmental compartments : Koc: 445

melamine:

Distribution among environmental compartments : Koc: 1.7

Other adverse effects**Product:**Ozone-Depletion Potential : Regulation: 40 CFR Protection of Environment; Part 82
Protection of Stratospheric Ozone - CAA Section 602 Class I Substances
Remarks: This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).Additional ecological information : An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Toxic to aquatic life with long lasting effects.**SECTION 13. DISPOSAL CONSIDERATIONS****Disposal methods**Waste from residues : Dispose of contents and container in accordance with all local, regional, national and international regulations.
Do not dispose of waste into sewer.
Do not contaminate ponds, waterways or ditches with chemical or used container.Contaminated packaging : Empty remaining contents.
Dispose of as unused product.
Do not re-use empty containers.

EPIBOND® 1544-1 A-82 US

Version 1.1 Revision Date: 08/16/2022 SDS Number: 400001013542 Date of last issue: 01/17/2017
Date of first issue: 01/17/2017

Print Date 02/23/2024

SECTION 14. TRANSPORT INFORMATION**International Regulations****IATA-DGR**

UN/ID No. : UN 3082
Proper shipping name : Environmentally hazardous substance, liquid, n.o.s.
(BISPHENOL A EPOXY RESIN, Bis(pentamethyl piperidinyloxy) ester of decanedioic acid)
Class : 9
Packing group : III
Labels : Miscellaneous
Packing instruction (cargo aircraft) : 964
Packing instruction (passenger aircraft) : 964
Environmentally hazardous : yes

IMDG-Code

UN number : UN 3082
Proper shipping name : ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.
(BISPHENOL A EPOXY RESIN, Bis(pentamethyl piperidinyloxy) ester of decanedioic acid)
Class : 9
Packing group : III
Labels : 9
EmS Code : F-A, S-F
Marine pollutant : yes

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable for product as supplied.

National Regulations**49 CFR**

UN/ID/NA number : UN 3082
Proper shipping name : Environmentally hazardous substance, liquid, n.o.s.
(BISPHENOL A EPOXY RESIN, Bis(pentamethyl piperidinyloxy) ester of decanedioic acid)
Class : 9
Packing group : III
Labels : CLASS 9
ERG Code : 171
Marine pollutant : yes
Remarks : Shipment by ground under DOT is non-regulated; however it may be shipped per the applicable hazard classification to facilitate multi-modal transport involving ICAO (IATA) or IMO.

Special precautions for user

Remarks : 49CFR: no dangerous good in non-bulk packaging

The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data

**EPIBOND® 1544-1 A-82 US**

Version	Revision Date:	SDS Number:	Date of last issue:
1.1	08/16/2022	400001013542	01/17/2017
			Date of first issue: 01/17/2017

Print Date 02/23/2024

Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

SECTION 15. REGULATORY INFORMATION**CERCLA Reportable Quantity**

Listed substances in the product are at low enough levels to not be expected to exceed the RQ

SARA 311/312 Hazards : Respiratory or skin sensitisation
Reproductive toxicity
Skin corrosion or irritation
Serious eye damage or eye irritation

SARA 313 : This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

This product does not contain any hazardous air pollutants (HAP), as defined by the U.S. Clean Air Act Section 112 (40 CFR 61).

California Prop. 65

WARNING: This product can expose you to chemicals including ethylbenzene, hexachlorobenzene, which is/are known to the State of California to cause cancer, and hexachlorobenzene, which is/are known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

The components of this product are reported in the following inventories:

DSL	: All components of this product are on the Canadian DSL
AIIC	: On the inventory, or in compliance with the inventory
NZIoC	: On the inventory, or in compliance with the inventory
ENCS	: On the inventory, or in compliance with the inventory
KECI	: On the inventory, or in compliance with the inventory
PICCS	: On the inventory, or in compliance with the inventory
IECSC	: On the inventory, or in compliance with the inventory
TCSI	: Not in compliance with the inventory
TSCA	: All substances listed as active on the TSCA inventory

Inventories

AIIC (Australia), DSL (Canada), IECSC (China), REACH (European Union), ENCS (Japan), ISHL (Japan), KECI (Korea), NZIoC (New Zealand), PICCS (Philippines), TCSI (Taiwan), TECI (Thailand), TSCA (USA)

TSCA - 5(a) Significant New Use Rule List of Chemicals

No substances are subject to a Significant New Use Rule.

EPIBOND® 1544-1 A-82 US

Version 1.1 Revision Date: 08/16/2022 SDS Number: 400001013542 Date of last issue: 01/17/2017
 Date of first issue: 01/17/2017

Print Date 02/23/2024

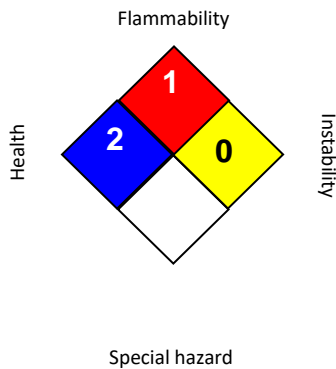
US. Toxic Substances Control Act (TSCA) Section 12(b) Export Notification (40 CFR 707, Subpt D)

No substances are subject to TSCA 12(b) export notification requirements.

SECTION 16. OTHER INFORMATION

Further information

NFPA 704:



HMIS® IV:

HEALTH	*	2
FLAMMABILITY		1
PHYSICAL HAZARD		0

HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. The "*" represents a chronic hazard, while the "/" represents the absence of a chronic hazard

Revision Date : 08/16/2022

The information and recommendations in this publication are to the best of our knowledge, information and belief accurate at the date of publication, NOTHING HEREIN IS TO BE CONSTRUED AS A WARRANTY, EXPRESS OR OTHERWISE.

IN ALL CASES, IT IS THE RESPONSIBILITY OF THE USER TO DETERMINE THE APPLICABILITY OF SUCH INFORMATION AND RECOMMENDATIONS AND THE SUITABILITY OF ANY PRODUCT FOR ITS OWN PARTICULAR PURPOSE.

THE PRODUCT MAY PRESENT HAZARDS AND SHOULD BE USED WITH CAUTION. WHILE CERTAIN HAZARDS ARE DESCRIBED IN THIS PUBLICATION, NO GUARANTEE IS MADE THAT THESE ARE THE ONLY HAZARDS THAT EXIST.

Hazards, toxicity and behaviour of the products may differ when used with other materials and are dependent upon the manufacturing circumstances or other processes. Such hazards, toxicity and behaviour should be determined by the user and made known to handlers, processors and end users.

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EPIBOND® 1544-1 A-82 US

Version	Revision Date:	SDS Number:	Date of last issue: 01/17/2017
1.1	08/16/2022	400001013542	Date of first issue: 01/17/2017

Print Date 02/23/2024

NO PERSON OR ORGANIZATION EXCEPT A DULY AUTHORIZED HUNTSMAN EMPLOYEE IS AUTHORIZED TO PROVIDE OR MAKE AVAILABLE DATA SHEETS FOR HUNTSMAN PRODUCTS. DATA SHEETS FROM UNAUTHORIZED SOURCES MAY CONTAIN INFORMATION THAT IS NO LONGER CURRENT OR ACCURATE.

EPIBOND® 1544 D US

Version 2.0 Revision Date: 02/01/2022 SDS Number: 400001009787 Date of last issue: 01/25/2017
Date of first issue: 01/25/2017

Print Date 02/23/2024

SECTION 1. IDENTIFICATION

Product name : EPIBOND® 1544 D US

Manufacturer or supplier's details

Company name of supplier : Huntsman Advanced Materials Americas LLC
Address : P.O. Box 4980
The Woodlands,
TX 77387
United States of America (USA)
Telephone : Non-Emergency: (800) 257-5547
E-mail address of person responsible for the SDS : Global_Product_EHS_AdMat@huntsman.com
Emergency telephone number : Chemtrec: (800) 424-9300 or (703) 527-3887

Recommended use of the chemical and restrictions on use

Recommended use : Hardener

SECTION 2. HAZARDS IDENTIFICATION**GHS classification in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200)**

Acute toxicity (Inhalation) : Category 3
Skin corrosion : Category 1B
Serious eye damage : Category 1
Skin sensitisation : Category 1
Reproductive toxicity : Category 2
Specific target organ toxicity - single exposure : Category 3 (Respiratory system)

GHS label elementsHazard pictograms : 

Signal word : Danger

Hazard statements : H314 Causes severe skin burns and eye damage.
H317 May cause an allergic skin reaction.
H331 Toxic if inhaled.
H335 May cause respiratory irritation.

**EPIBOND® 1544 D US**

Version	Revision Date:	SDS Number:	Date of last issue:
2.0	02/01/2022	400001009787	01/25/2017
			Date of first issue: 01/25/2017

Print Date 02/23/2024

H361 Suspected of damaging fertility or the unborn child.

Precautionary statements

: **Prevention:**

P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.
P260 Do not breathe dust.
P264 Wash skin thoroughly after handling.
P271 Use only outdoors or in a well-ventilated area.
P272 Contaminated work clothing must not be allowed out of the workplace.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response:

P301 + P330 + P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P304 + P340 + P310 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/ doctor.
P305 + P351 + P338 + P310 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/ doctor.
P308 + P313 IF exposed or concerned: Get medical advice/ attention.
P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention.
P363 Wash contaminated clothing before reuse.
Storage:
P403 + P233 Store in a well-ventilated place. Keep container tightly closed.
P405 Store locked up.
Disposal:
P501 Dispose of contents/container to an approved facility in accordance with local, regional, national and international regulations.

Other hazards

None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Chemical nature : Amines

Hazardous components

Chemical name	CAS-No.	Concentration (% w/w)
Diethylenetriamine	111-40-0	30 - 50
2-piperazin-1-ylethylamine	140-31-8	0.1 - 1

EPIBOND® 1544 D US

Version 2.0 Revision Date: 02/01/2022 SDS Number: 400001009787 Date of last issue: 01/25/2017
Date of first issue: 01/25/2017

Print Date 02/23/2024

The specific chemical identity and/or exact percentage (concentration) of composition may be withheld as a trade secret.

SECTION 4. FIRST AID MEASURES

- General advice : Move out of dangerous area.
Consult a physician.
Show this safety data sheet to the doctor in attendance.
Symptoms of poisoning may appear several hours later.
Treat symptomatically.
Get medical attention if symptoms occur.
- If inhaled : Call a physician or poison control centre immediately.
If inhaled, remove to fresh air.
Get medical attention if symptoms occur.
- In case of skin contact : Immediate medical treatment is necessary as untreated wounds from corrosion of the skin heal slowly and with difficulty.
If on skin, rinse well with water.
If on clothes, remove clothes.
- In case of eye contact : Small amounts splashed into eyes can cause irreversible tissue damage and blindness.
In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
Continue rinsing eyes during transport to hospital.
Remove contact lenses.
Keep eye wide open while rinsing.
If eye irritation persists, consult a specialist.
- If swallowed : Keep respiratory tract clear.
Do NOT induce vomiting.
Never give anything by mouth to an unconscious person.
If symptoms persist, call a physician.
Take victim immediately to hospital.
- Most important symptoms and effects, both acute and delayed : None known.
- Protection of first-aiders : First Aid responders should pay attention to self-protection and use the recommended protective clothing
If potential for exposure exists refer to Section 8 for specific personal protective equipment.
Avoid inhalation, ingestion and contact with skin and eyes.
No action shall be taken involving any personal risk or without suitable training.
It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

EPIBOND® 1544 D US

Version 2.0 Revision Date: 02/01/2022 SDS Number: 400001009787 Date of last issue: 01/25/2017
Date of first issue: 01/25/2017

Print Date 02/23/2024

Notes to physician : Treat symptomatically.

SECTION 5. FIREFIGHTING MEASURES

- Suitable extinguishing media : Water spray
Alcohol-resistant foam
Carbon dioxide (CO₂)
Dry chemical
- Unsuitable extinguishing media : Exercise caution when using a high volume water jet as it may scatter and spread fire
- Specific hazards during firefighting : Do not allow run-off from fire fighting to enter drains or water courses.
- Hazardous combustion products : Carbon dioxide (CO₂)
Carbon monoxide
Nitrogen oxides (NO_x)
- Specific extinguishing methods : Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
- Further information : Collect contaminated fire extinguishing water separately. This must not be discharged into drains.
Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.
- Special protective equipment for firefighters : Wear self-contained breathing apparatus for firefighting if necessary.

SECTION 6. ACCIDENTAL RELEASE MEASURES

- Personal precautions, protective equipment and emergency procedures : Use personal protective equipment.
Avoid dust formation.
Avoid breathing dust.
Ensure adequate ventilation.
Evacuate personnel to safe areas.
Refer to protective measures listed in sections 7 and 8.
- Environmental precautions : Prevent product from entering drains.
Prevent further leakage or spillage if safe to do so.
If the product contaminates rivers and lakes or drains inform respective authorities.
- Methods and materials for containment and cleaning up : Keep in suitable, closed containers for disposal.

SECTION 7. HANDLING AND STORAGE

**EPIBOND® 1544 D US**

Version 2.0 Revision Date: 02/01/2022 SDS Number: 400001009787 Date of last issue: 01/25/2017
Date of first issue: 01/25/2017

Print Date 02/23/2024

- Advice on protection against fire and explosion : Avoid dust formation.
Provide appropriate exhaust ventilation at places where dust is formed.
- Advice on safe handling : Repeated or prolonged skin contact may cause skin irritation and/or dermatitis and sensitisation of susceptible persons. Persons suffering from asthma, eczema or skin problems should avoid contact, including dermal contact, with this product.
Avoid formation of respirable particles.
Do not breathe vapours/dust.
Avoid exposure - obtain special instructions before use.
Avoid contact with skin and eyes.
For personal protection see section 8.
Smoking, eating and drinking should be prohibited in the application area.
Provide sufficient air exchange and/or exhaust in work rooms.
Dispose of rinse water in accordance with local and national regulations.
- Conditions for safe storage : Prevent unauthorized access.
Keep container tightly closed in a dry and well-ventilated place.
Containers which are opened must be carefully resealed and kept upright to prevent leakage.
Observe label precautions.
Keep in properly labelled containers.
- Materials to avoid : For incompatible materials please refer to Section 10 of this SDS.
- Recommended storage temperature : 36 - 104 °F / 2 - 40 °C
- Further information on storage stability : Stable under normal conditions.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION**Components with workplace control parameters**

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
Diethylenetriamine	111-40-0	TWA	1 ppm	ACGIH
		TWA	1 ppm 4 mg/m ³	NIOSH REL
		TWA	1 ppm 4 mg/m ³	OSHA P0

Personal protective equipment

- Respiratory protection : General and local exhaust ventilation is recommended to maintain vapor exposures below recommended limits. Where concentrations are above recommended limits or are

EPIBOND® 1544 D US

Version	Revision Date:	SDS Number:	Date of last issue:
2.0	02/01/2022	400001009787	01/25/2017
			Date of first issue: 01/25/2017

Print Date 02/23/2024

unknown, appropriate respiratory protection should be worn. Follow OSHA respirator regulations (29 CFR 1910.134) and use NIOSH/MSHA approved respirators. Protection provided by air purifying respirators against exposure to any hazardous chemical is limited. Use a positive pressure air supplied respirator if there is any potential for uncontrolled release, exposure levels are unknown, or any other circumstance where air purifying respirators may not provide adequate protection.

Hand protection

Material : butyl-rubber
 Break through time : > 8 h

Material : Solvent-resistant gloves (butyl-rubber)
 Material : Nitrile rubber
 Break through time : 10 - 480 min

Remarks

: Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.
 The suitability for a specific workplace should be discussed with the producers of the protective gloves.

Eye protection

: Eye wash bottle with pure water
 Tightly fitting safety goggles
 Wear face-shield and protective suit for abnormal processing problems.

Skin and body protection

: Choose body protection according to the amount and concentration of the dangerous substance at the work place.

Hygiene measures

: Avoid contact with skin, eyes and clothing.
 When using do not eat or drink.
 When using do not smoke.
 Wash hands before breaks and immediately after handling the product.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance : paste
 Colour : translucent
 Odour : amine-like
 Odour Threshold : No data is available on the product itself.
 pH : No data is available on the product itself.
 Melting point/freezing point : No data is available on the product itself.
 Boiling point : > 392 °F / > 200 °C

**EPIBOND® 1544 D US**

Version 2.0 Revision Date: 02/01/2022 SDS Number: 400001009787 Date of last issue: 01/25/2017
Date of first issue: 01/25/2017

Print Date 02/23/2024

Flash point : > 212 °F / > 100 °C
Method: Pensky-Martens closed cup

Evaporation rate : No data is available on the product itself.

Flammability (solid, gas) : No data is available on the product itself.

Flammability (liquids) : No data is available on the product itself.

Upper explosion limit / Upper flammability limit : No data is available on the product itself.

Lower explosion limit / Lower flammability limit : No data is available on the product itself.

Vapour pressure : < 0.5 hPa (68 °F / 20 °C)

Relative vapour density : No data is available on the product itself.

Relative density : No data is available on the product itself.

Density : ca. 1 g/cm³ (77 °F / 25 °C)

Solubility(ies)
Water solubility : partly soluble (68 °F / 20 °C)

Solubility in other solvents : No data is available on the product itself.

Partition coefficient: n-octanol/water : No data is available on the product itself.

Auto-ignition temperature : No data is available on the product itself.

Decomposition temperature : > 392 °F / > 200 °C

Self-Accelerating decomposition temperature (SADT) : No data is available on the product itself.

Viscosity : No data is available on the product itself.

Explosive properties : No data is available on the product itself.

Oxidizing properties : No data is available on the product itself.

Particle size : No data is available on the product itself.

SECTION 10. STABILITY AND REACTIVITY

Reactivity : No dangerous reaction known under conditions of normal use.

Chemical stability : Stable under normal conditions.

Possibility of hazardous : Dust may form explosive mixture in air.

EPIBOND® 1544 D US

Version	Revision Date:	SDS Number:	Date of last issue:
2.0	02/01/2022	400001009787	01/25/2017
			Date of first issue: 01/25/2017

Print Date 02/23/2024

reactions

Conditions to avoid : None known.

Incompatible materials : None known.

Hazardous decomposition products : carbon monoxide
carbon dioxide
Nitrogen oxides (NO_x)

SECTION 11. TOXICOLOGICAL INFORMATION**Acute toxicity****Product:**

Acute oral toxicity : Acute toxicity estimate: 4,837 mg/kg
Method: Calculation method

Acute inhalation toxicity : Acute toxicity estimate: 0.5523 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Method: Calculation method

Assessment: The substance/mixture is not toxic on inhalation as defined by dangerous goods regulations.

Acute dermal toxicity : Acute toxicity estimate: 2,853 mg/kg
Method: Calculation method

Components:**Diethylenetriamine:**

Acute oral toxicity : LD50 (Rat, male): 1,620 mg/kg

Acute inhalation toxicity : LC50 (Rat, male and female): 0.185 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Method: OECD Test Guideline 403

Acute dermal toxicity : LD50 (Rabbit): 1,045 mg/kg

2-piperazin-1-ylethylamine:

Acute oral toxicity : LD50 (Rabbit, male): 2,097 mg/kg
Assessment: The component/mixture is moderately toxic after single ingestion.

Acute dermal toxicity : LD50 (Rabbit, male): 866 mg/kg
Assessment: The component/mixture is toxic after single contact with skin.

EPIBOND® 1544 D US

Version 2.0 Revision Date: 02/01/2022 SDS Number: 400001009787 Date of last issue: 01/25/2017
Date of first issue: 01/25/2017

Print Date 02/23/2024

Skin corrosion/irritation**Components:****Diethylenetriamine:**

Species : Rabbit
Assessment : Causes burns.
Result : Causes burns.

2-piperazin-1-ylethylamine:

Species : Rabbit
Assessment : Causes burns.
Result : Causes burns.

Serious eye damage/eye irritation**Components:****Diethylenetriamine:**

Species : Rabbit
Result : Corrosive
Assessment : Corrosive

2-piperazin-1-ylethylamine:

Species : Rabbit
Result : Risk of serious damage to eyes.
Assessment : Risk of serious damage to eyes.

Respiratory or skin sensitisation**Components:****Diethylenetriamine:**

Exposure routes : Skin
Species : Mouse
Method : OECD Test Guideline 429
Result : May cause sensitisation by skin contact.
Remarks : Causes sensitisation.

Exposure routes : Respiratory Tract
Species : Mouse
Result : Does not cause respiratory sensitisation.

2-piperazin-1-ylethylamine:

Test Type : Maximisation Test
Exposure routes : Skin
Species : Guinea pig
Assessment : May cause sensitisation by skin contact.
Method : OECD Test Guideline 406
Result : May cause sensitisation by skin contact.

EPIBOND® 1544 D US

Version 2.0 Revision Date: 02/01/2022 SDS Number: 400001009787 Date of last issue: 01/25/2017
Date of first issue: 01/25/2017

Print Date 02/23/2024

Germ cell mutagenicity**Components:****Diethylenetriamine:**

Genotoxicity in vivo : Cell type: Somatic
Application Route: Oral
Dose: 85 - 850 mg/kg
Method: OECD Test Guideline 474
Result: negative

Application Route: Oral
Result: negative

2-piperazin-1-ylethylamine:

Genotoxicity in vitro : Test Type: reverse mutation assay
Test system: Salmonella typhimurium
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: negative

Test Type: gene mutation test
Test system: Chinese hamster ovary cells
Metabolic activation: with and without metabolic activation
Result: negative

Test Type: sister chromatid exchange assay
Test system: Chinese hamster ovary cells
Metabolic activation: with and without metabolic activation
Result: negative

Test Type: unscheduled DNA synthesis assay
Test system: rat hepatocytes
Metabolic activation: negative
Result: negative

Test Type: gene mutation test
Test system: mouse lymphoma cells
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 490
Result: negative
GLP: yes

Genotoxicity in vivo : Test Type: In vivo micronucleus test
Species: Mouse (male and female)
Application Route: Intraperitoneal injection
Dose: 175 - 560 mg/kg
Method: OECD Test Guideline 474
Result: negative

Carcinogenicity**Components:****Diethylenetriamine:**

Species : Mouse, male

EPIBOND® 1544 D US

Version	Revision Date:	SDS Number:	Date of last issue: 01/25/2017
2.0	02/01/2022	400001009787	Date of first issue: 01/25/2017

Print Date 02/23/2024

Application Route : Dermal
 Dose : 56.3 mg/kg
 Frequency of Treatment : 3 daily
 Result : negative

IARC No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

OSHA No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

NTP No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

Reproductive toxicity**Components:****Diethylenetriamine:**

Effects on fertility : Species: Rat, male and female
 Application Route: Oral
 General Toxicity - Parent: NOAEL: 30 mg/kg wet weight
 Method: OECD Test Guideline 421

Effects on foetal development : Species: Rat
 Application Route: Oral
 General Toxicity Maternal: NOAEL: 100 mg/kg body weight
 Method: OECD Test Guideline 421
 Result: No adverse effects

2-piperazin-1-ylethylamine:

Effects on fertility : Test Type: Combined Repeated Dose Toxicity Study with the Reproduction / Developmental Toxicity Screening Test
 Species: Rat, male and female
 Application Route: Oral
 Dose: 500/2000/8000 ppm
 Duration of Single Treatment: 28 d
 General Toxicity - Parent: NOAEC: 8,000 ppm
 General Toxicity F1: NOEL: 8,000 ppm
 Method: OECD Test Guideline 422

Effects on foetal development : Test Type: reproductive and developmental toxicity study
 Species: Rat, male and female
 Application Route: Oral
 General Toxicity Maternal: LOAEC: 8,000 ppm
 Developmental Toxicity: NOEL: 8,000 ppm
 Method: OECD Test Guideline 422

Test Type: Pre-natal
 Species: Rat, female
 Application Route: Oral
 Duration of Single Treatment: 14 d
 General Toxicity Maternal: NOAEL: 1,000 mg/kg body weight
 Developmental Toxicity: NOEL: 1,000 mg/kg body weight
 Method: OECD Test Guideline 414

**EPIBOND® 1544 D US**

Version	Revision Date:	SDS Number:	Date of last issue: 01/25/2017
2.0	02/01/2022	400001009787	Date of first issue: 01/25/2017

Print Date 02/23/2024

Test Type: Pre-natal
 Species: Rabbit, female
 Application Route: Oral
 Duration of Single Treatment: 23 d
 General Toxicity Maternal: NOAEL: 75 mg/kg body weight
 Developmental Toxicity: NOAEL: 75 mg/kg body weight
 Method: OECD Test Guideline 414

Reproductive toxicity - Assessment : Some evidence of adverse effects on sexual function and fertility, and/or on development, based on animal experiments.

STOT - single exposure**Components:****Diethylenetriamine:**

Target Organs : Respiratory Tract
 Assessment : May cause respiratory irritation.

STOT - repeated exposure**Components:****2-piperazin-1-ylethylamine:**

Exposure routes : Inhalation
 Target Organs : Respiratory Tract
 Assessment : Causes damage to organs through prolonged or repeated exposure.

Repeated dose toxicity**Components:****Diethylenetriamine:**

Species : Rat, male and female
 NOEC : 70 - 80 mg/m³
 Application Route : Ingestion
 Test atmosphere : vapour
 Exposure time : 360 h
 Number of exposures : 7 d
 Method : Subchronic toxicity

Species : Rat, male and female
 NOAEL : 114 mg/kg/d
 Application Route : Skin contact
 Exposure time : 9,600 h
 Number of exposures : 6 d
 Method : Chronic toxicity

2-piperazin-1-ylethylamine:

Species : Rat, male and female
 NOAEL : 152 mg/kg/d
 Application Route : oral (drinking water)
 Exposure time : 28 d
 Method : OECD Test Guideline 422

EPIBOND® 1544 D US

Version 2.0 Revision Date: 02/01/2022 SDS Number: 400001009787 Date of last issue: 01/25/2017
 Date of first issue: 01/25/2017

Print Date 02/23/2024

Species : Rat, male and female
 NOAEL : > 1000 mg/kg/d
 Application Route : Dermal
 Exposure time : 29 d
 Number of exposures : 6h/d, 5d/w
 Method : OECD Test Guideline 410

Species : Rat, male and female
 NOEC : 0.2 mg/m³
 Application Route : Inhalation
 Exposure time : 90 d
 Number of exposures : 6h/d, 5d/w
 Method : OECD Test Guideline 413
 Target Organs : Respiratory Tract
 Assessment : The substance or mixture is classified as specific target organ toxicant, repeated exposure, category 1.

Species : Rat, male and female
 NOEC : 53.3 mg/m³
 Application Route : Inhalation
 Exposure time : 90 d
 Number of exposures : 6h/d, 5d/w
 Method : OECD Test Guideline 413

Aspiration toxicity

No data available

Experience with human exposure

No data available

Toxicology, Metabolism, Distribution

No data available

Neurological effects

No data available

Further information

No data available

SECTION 12. ECOLOGICAL INFORMATION
Ecotoxicity
Components:
Diethylenetriamine:

Toxicity to fish : LC50: 430 mg/l
 Exposure time: 96 h
 Test Type: semi-static test
 Test substance: Fresh water
 Method: Directive 67/548/EEC, Annex V, C.1.

Toxicity to daphnia and other : EC50 (Daphnia magna (Water flea)): 64.6 mg/l
 aquatic invertebrates : Exposure time: 48 h
 Test Type: static test
 Test substance: Fresh water
 Method: Regulation (EC) No. 440/2008, Annex, C.2

**EPIBOND® 1544 D US**

Version	Revision Date:	SDS Number:	Date of last issue:
2.0	02/01/2022	400001009787	01/25/2017
			Date of first issue: 01/25/2017

Print Date 02/23/2024

- EC50 (*Daphnia magna* (Water flea)): 16 mg/l
Exposure time: 48 h
Test Type: static test
Test substance: Fresh water
Method: DIN 38412
- Toxicity to algae/aquatic plants : EbC50 (*Selenastrum capricornutum* (green algae)): 1,164 mg/l
Exposure time: 72 h
Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 201
- Toxicity to fish (Chronic toxicity) : NOEC: 10 mg/l
Exposure time: 28 d
Test Type: semi-static test
Test substance: Fresh water
Method: OECD Test Guideline 210
- Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (*Daphnia magna* (Water flea)): 5.6 mg/l
Exposure time: 21 d
Test Type: semi-static test
Test substance: Fresh water
Method: Directive 67/548/EEC, Annex V, C.20
- Toxicity to soil dwelling organisms : EC50 (*Eisenia fetida* (earthworms)): > 1,000 mg/kg
Exposure time: 56 d
Method: OECD Test Guideline 222
- Ecotoxicology Assessment**
- Acute aquatic toxicity : This product has no known ecotoxicological effects.
- 2-piperazin-1-ylethylamine:**
- Toxicity to fish : LC50 (*Pimephales promelas* (fathead minnow)): 2,190 mg/l
End point: mortality
Exposure time: 96 h
Test Type: static test
Test substance: Fresh water
- Toxicity to daphnia and other aquatic invertebrates : EC50 (*Daphnia magna* (Water flea)): 58 mg/l
End point: Immobilization
Exposure time: 48 h
Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 202
Remarks: Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
- Toxicity to algae/aquatic plants : EC50 (*Selenastrum capricornutum* (green algae)): > 1,000 mg/l
Exposure time: 72 h
Test substance: Fresh water
Method: OECD Test Guideline 201

**EPIBOND® 1544 D US**

Version	Revision Date:	SDS Number:	Date of last issue:
2.0	02/01/2022	400001009787	01/25/2017
			Date of first issue: 01/25/2017

Print Date 02/23/2024

Toxicity to microorganisms : EC50 (Bacteria): > 100 mg/l
mg/kg
Exposure time: 28 d
Method: OECD Test Guideline 216

EC50 (activated sludge): 511 mg/l
Exposure time: 2 h
Test Type: static test
Test substance: Fresh water
Method: ISO Method, other

Toxicity to soil dwelling organisms : LC50 (Eisenia fetida (earthworms)): 712 mg/kg
Exposure time: 56 d
Method: OECD Test Guideline 222

NOEC (Eisenia fetida (earthworms)): 500 mg/kg
Exposure time: 56 d
Method: OECD Test Guideline 222

Persistence and degradability**Components:****Diethylenetriamine:**

Biodegradability : Inoculum: activated sludge
Result: Readily biodegradable.
Biodegradation: 87 %
Exposure time: 21 d
Method: OECD Test Guideline 301D

Photodegradation : Test Type: Air
Rate constant: 500000
Degradation (direct photolysis): 50 %

2-piperazin-1-ylethylamine:

Biodegradability : aerobic
Inoculum: activated sludge
Result: Not readily biodegradable.
Biodegradation: 0 %
Exposure time: 28 d
Method: OECD Test Guideline 301F

Biochemical Oxygen Demand (BOD) : 5 mg/l
Incubation time: 5 d

Chemical Oxygen Demand (COD) : 560 mg/l

Photodegradation : Test Type: Air
Degradation (direct photolysis): 50 %

Bioaccumulative potential**Components:****Diethylenetriamine:**

EPIBOND® 1544 D US

Version 2.0 Revision Date: 02/01/2022 SDS Number: 400001009787 Date of last issue: 01/25/2017
Date of first issue: 01/25/2017

Print Date 02/23/2024

Bioaccumulation : Species: Cyprinus carpio (Carp)
Bioconcentration factor (BCF): 0.3 - 6.3
Exposure time: 42 d
Test substance: Fresh water
Method: flow-through test
Remarks: Bioaccumulation is unlikely.

Partition coefficient: n-octanol/water : log Pow: -1.58 (68 °F / 20 °C)
pH: 7

2-piperazin-1-ylethylamine:

Bioaccumulation : Species: Fish
Remarks: Does not bioaccumulate.

Partition coefficient: n-octanol/water : log Pow: -1.48 (68 °F / 20 °C)

Mobility in soil**Components:****Diethylenetriamine:**

Distribution among environmental compartments : Koc: 19111

2-piperazin-1-ylethylamine:

Distribution among environmental compartments : Koc: ca. 37000

Other adverse effects**Product:**

Ozone-Depletion Potential : Regulation: 40 CFR Protection of Environment; Part 82
Protection of Stratospheric Ozone - CAA Section 602 Class I
Substances
Remarks: This product neither contains, nor was
manufactured with a Class I or Class II ODS as defined by the
U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A +
B).

SECTION 13. DISPOSAL CONSIDERATIONS**Disposal methods**

Waste from residues : Dispose of contents and container in accordance with all local,
regional, national and international regulations.
Do not dispose of waste into sewer.
Do not contaminate ponds, waterways or ditches with
chemical or used container.

Contaminated packaging : Empty remaining contents.
Dispose of as unused product.
Do not re-use empty containers.

EPIBOND® 1544 D US

Version 2.0 Revision Date: 02/01/2022 SDS Number: 400001009787 Date of last issue: 01/25/2017
Date of first issue: 01/25/2017

Print Date 02/23/2024

SECTION 14. TRANSPORT INFORMATION**International Regulations****IATA-DGR**

UN/ID No. : UN 3259
Proper shipping name : Amines, solid, corrosive, n.o.s.
(DIETHYLENETRIAMINE)
Class : 8
Packing group : II
Labels : Corrosive
Packing instruction (cargo aircraft) : 863
Packing instruction (passenger aircraft) : 859

IMDG-Code

UN number : UN 3259
Proper shipping name : AMINES, SOLID, CORROSIVE, N.O.S.
(DIETHYLENETRIAMINE)
Class : 8
Packing group : II
Labels : 8
EmS Code : F-A, S-B
Marine pollutant : no

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable for product as supplied.

National Regulations**49 CFR**

UN/ID/NA number : UN 3259
Proper shipping name : Amines, solid, corrosive, n.o.s.
(DIETHYLENETRIAMINE)
Class : 8
Packing group : II
Labels : CORROSIVE
ERG Code : 154
Marine pollutant : no

Special precautions for user

The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

SECTION 15. REGULATORY INFORMATION**CERCLA Reportable Quantity**

This material does not contain any components with a CERCLA RQ.

SARA 311/312 Hazards : Reproductive toxicity
Acute toxicity (any route of exposure)
Skin corrosion or irritation
Serious eye damage or eye irritation
Respiratory or skin sensitisation

EPIBOND® 1544 D US

Version 2.0 Revision Date: 02/01/2022 SDS Number: 400001009787 Date of last issue: 01/25/2017
Date of first issue: 01/25/2017

Print Date 02/23/2024

Specific target organ toxicity (single or repeated exposure)

SARA 313 : This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

This product does not contain any hazardous air pollutants (HAP), as defined by the U.S. Clean Air Act Section 112 (40 CFR 61).

California Prop. 65

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

The components of this product are reported in the following inventories:

DSL : This product contains one or several components that are not on the Canadian DSL nor NDSL.

AIIC : On the inventory, or in compliance with the inventory

NZIoC : On the inventory, or in compliance with the inventory

ENCS : On the inventory, or in compliance with the inventory

KECI : On the inventory, or in compliance with the inventory

PICCS : On the inventory, or in compliance with the inventory

IECSC : On the inventory, or in compliance with the inventory

TCSI : Not in compliance with the inventory

TSCA : All substances listed as active on the TSCA inventory

Inventories

AIIC (Australia), DSL (Canada), IECSC (China), REACH (European Union), ENCS (Japan), ISHL (Japan), KECI (Korea), NZIoC (New Zealand), PICCS (Philippines), TCSI (Taiwan), TECI (Thailand), TSCA (USA)

TSCA - 5(a) Significant New Use Rule List of Chemicals

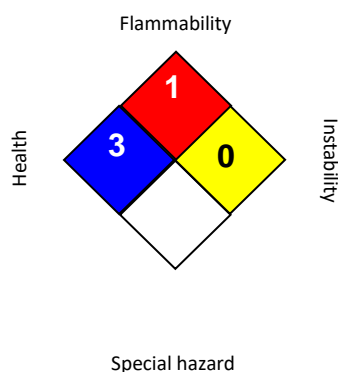
No substances are subject to a Significant New Use Rule.

US. Toxic Substances Control Act (TSCA) Section 12(b) Export Notification (40 CFR 707, Subpt D)

No substances are subject to TSCA 12(b) export notification requirements.

EPIBOND® 1544 D US
 Version 2.0 Revision Date: 02/01/2022 SDS Number: 400001009787 Date of last issue: 01/25/2017
 Date of first issue: 01/25/2017

Print Date 02/23/2024

SECTION 16. OTHER INFORMATION**Further information****NFPA 704:****HMIS® IV:**

HEALTH	*	3
FLAMMABILITY		1
PHYSICAL HAZARD		0

HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. The "*" represents a chronic hazard, while the "/" represents the absence of a chronic hazard

Revision Date : 02/01/2022

ACGIH : USA. ACGIH Threshold Limit Values (TLV)
 NIOSH REL : USA. NIOSH Recommended Exposure Limits
 OSHA P0 : USA. Table Z-1-A Limits for Air Contaminants (1989 vacated values)

ACGIH / TWA : 8-hour, time-weighted average
 NIOSH REL / TWA : Time-weighted average concentration for up to a 10-hour workday during a 40-hour workweek

OSHA P0 / TWA : 8-hour time weighted average

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IN ALL CASES, IT IS THE RESPONSIBILITY OF THE USER TO DETERMINE THE APPLICABILITY OF SUCH INFORMATION AND RECOMMENDATIONS AND THE SUITABILITY OF ANY PRODUCT FOR ITS OWN PARTICULAR PURPOSE.

THE PRODUCT MAY PRESENT HAZARDS AND SHOULD BE USED WITH CAUTION. WHILE CERTAIN HAZARDS ARE DESCRIBED IN THIS PUBLICATION, NO GUARANTEE IS MADE THAT THESE ARE THE ONLY HAZARDS THAT EXIST.

Hazards, toxicity and behaviour of the products may differ when used with other materials and are dependent upon the manufacturing circumstances or other processes. Such hazards, toxicity and behaviour should be determined by the user and made known to handlers, processors and end users.

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EPIBOND® 1544 D US

Version	Revision Date:	SDS Number:	Date of last issue:
2.0	02/01/2022	400001009787	01/25/2017
			Date of first issue: 01/25/2017

Print Date 02/23/2024

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