

ARALDITE® 2035 B US

Version 1.1 Revision Date: 09/22/2022 SDS Number: 400000013118 Date of last issue: 07/27/2022
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SECTION 1. IDENTIFICATION

Product name : ARALDITE® 2035 B US



chemical-concepts.com

800.220.1966

410 Pike Road • Huntingdon Valley, PA 19006

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

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

Acute toxicity (Oral) : Category 4

Skin corrosion : Category 1B

Serious eye damage : Category 1

Skin sensitisation : Category 1

Specific target organ toxicity - repeated exposure : Category 2 (Kidney, Liver, Adrenal gland, spleen)

Specific target organ toxicity - repeated exposure (Oral) : Category 2 (Liver)

Short-term (acute) aquatic hazard : Category 3

Long-term (chronic) aquatic hazard : Category 3



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GHS label elements

Hazard pictograms :



Signal word : Danger

Hazard statements : H302 Harmful if swallowed.
H314 Causes severe skin burns and eye damage.

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H317 May cause an allergic skin reaction.
 H373 May cause damage to organs (Kidney, Liver, Adrenal gland, spleen) through prolonged or repeated exposure.
 H373 May cause damage to organs (Liver) through prolonged or repeated exposure if swallowed.
 H412 Harmful to aquatic life with long lasting effects.

Precautionary statements

: **Prevention:**

P260 Do not breathe mist or vapours.
 P264 Wash skin thoroughly after handling.
 P270 Do not eat, drink or smoke when using this product.
 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:

P301 + P312 + P330 IF SWALLOWED: Call a POISON CENTER/ doctor if you feel unwell. Rinse mouth.
 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.
 P314 Get medical advice/ attention if you feel unwell.
 P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention.
 P363 Wash contaminated clothing before reuse.

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

Chemical nature : Amines

Hazardous components

| Chemical name | CAS-No. | Concentration (% w/w) |
|-----------------------------|-----------|-----------------------|
| aluminium | 7429-90-5 | 30 - 50 |
| m-phenylenebis(methylamine) | 1477-55-0 | 10 - 20 |

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| | | |
|--|-------------|--------|
| Formaldehyde, polymer with benzenamine, hydrogenated | 135108-88-2 | 5 - 10 |
| 4,4'-methylenebis(cyclohexylamine) | 1761-71-3 | 5 - 10 |
| 1,3-Benzenedimethanamine, reaction products with epichlorohydrin | 135470-04-1 | 5 - 10 |
| Triethylenetetramine, propoxylated | 26950-63-0 | 5 - 10 |
| 2,2',2''-nitrioltriethanol | 102-71-6 | 1 - 5 |
| trientine | 112-24-3 | 1 - 5 |

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.
 Treat symptomatically.
 Get medical attention if symptoms occur.
- If inhaled : Consult a physician after significant exposure.
 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 : None known.

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and effects, both acute and delayed

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.

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 : Metal oxides
Carbon oxides
Nitrogen oxides (NO_x)
Formaldehyde
- 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.
Ensure adequate ventilation.
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.

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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 product.
 Avoid formation of aerosol.
 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.
 To avoid spills during handling keep bottle on a metal tray.
 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.

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 |
|------------|-----------|-------------------------------|--|----------|
| aluminium | 7429-90-5 | TWA (total dust) | 15 mg/m ³ (Aluminium) | OSHA Z-1 |

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| | | TWA (respirable fraction) | 5 mg/m3 (Aluminium) | OSHA Z-1 |
| | | TWA (Respirable particulate matter) | 1 mg/m3 (Aluminium) | ACGIH |
| | | TWA (Respirable) | 5 mg/m3 | NIOSH REL |
| | | TWA (total) | 10 mg/m3 | NIOSH REL |
| | | TWA (Total dust) | 15 mg/m3 (Aluminium) | OSHA P0 |
| | | TWA (respirable dust fraction) | 5 mg/m3 (Aluminium) | OSHA P0 |
| m-phenylenebis(methylamine) | 1477-55-0 | C | 0.018 ppm | ACGIH |
| | | C | 0.1 mg/m3 | NIOSH REL |
| | | C | 0.1 mg/m3 | OSHA P0 |
| 2,2',2"-nitrilotriethanol | 102-71-6 | TWA | 5 mg/m3 | ACGIH |

Personal protective equipment

- Respiratory protection : No personal respiratory protective equipment normally required.
- Respiratory protection : In the case of vapour formation use a respirator with an approved filter.
- Hand protection
- 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

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| | |
|--|---|
| Colour | : grey |
| Odour | : No data is available on the product itself. |
| 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 | : > 212 °F / > 100 °C |
| 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. |
| Relative vapour density | : No data is available on the product itself. |
| Relative density | : No data is available on the product itself. |
| Density | : 1.38 - 1.46 g/cm ³ |
| 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. |

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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 : None known.

Hazardous decomposition products : No decomposition if stored and applied as directed.

Hazardous decomposition products : aluminium oxide
carbon monoxide
carbon dioxide
Nitrogen oxides (NO_x)
ammonia, anhydrous
Aldehydes
Ketones

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

Acute oral toxicity : Acute toxicity estimate: 1,521 mg/kg
Method: Calculation method

Acute inhalation toxicity : Acute toxicity estimate: 8.54 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Method: Calculation method

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

Components:**m-phenylenebis(methylamine):**

Acute oral toxicity : LD50 (Rat, male and female): 930 mg/kg
Method: OECD Test Guideline 401

Acute inhalation toxicity : LC50 (Rat, male and female): ca. 1.34 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Method: OECD Test Guideline 403
GLP: yes

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Assessment: Corrosive to the respiratory tract.

Acute dermal toxicity : LD50 (Rat, male and female): > 3,100 mg/kg
Method: Other guidelines
Symptoms: Necrosis, Erythema
Assessment: The substance or mixture has no acute dermal toxicity

Formaldehyde, polymer with benzenamine, hydrogenated:

Acute oral toxicity : LD50 Oral (Rat, female): 300 mg/kg
Method: OECD Test Guideline 423
GLP: yes

Acute dermal toxicity : LD50 Dermal (Rabbit, male and female): > 1,000 mg/kg
Method: Other guidelines
GLP: yes
Assessment: The substance or mixture has no acute dermal toxicity

4,4'-methylenebis(cyclohexylamine):

Acute oral toxicity : LD50 Oral: 625 mg/kg

Acute inhalation toxicity : LC50 (Rat, male): >0.4%
Exposure time: 6 h
Test atmosphere: vapour

Acute dermal toxicity : LD50 (Rabbit, male and female): 2,110 mg/kg

1,3-Benzenedimethanamine, reaction products with epichlorohydrin:

Acute oral toxicity : LD50 (Rat, male): 646 mg/kg
Assessment: The component/mixture is moderately toxic after single ingestion.

LD50 (Rat, female): 744 mg/kg
Assessment: The component/mixture is moderately toxic after single ingestion.

Acute inhalation toxicity : LC50 (Rat): 1.34 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Method: Calculation method
Assessment: The component/mixture is moderately toxic after short term inhalation.

Triethylenetetramine, propoxylated:

Acute oral toxicity : LD50 Oral (Rat): 4,500 mg/kg

Acute dermal toxicity : LD50 (Rat): >= 2,150 mg/kg

2,2',2''-nitriлотriethanol:

Acute oral toxicity : LD50 (Rat, male and female): 6,400 mg/kg
Method: OECD Test Guideline 401

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Acute inhalation toxicity : LC0 (Rat, male and female): 1.8 mg/m3
Exposure time: 8 h
Test atmosphere: vapour
Method: OECD Test Guideline 403

Acute dermal toxicity : LD50 (Rabbit, male and female): > 5,000 mg/kg

trientine:

Acute oral toxicity : LD50 (Rat, male and female): 1,716.2 mg/kg
Method: OECD Test Guideline 401
Assessment: The component/mixture is moderately toxic after single ingestion.

Acute dermal toxicity : LD50 (Rabbit, male and female): 1,465.4 mg/kg
Method: OECD Test Guideline 402
Assessment: The component/mixture is moderately toxic after single contact with skin.

Skin corrosion/irritation**Components:****m-phenylenebis(methylamine):**

Species : Rat
Assessment : Causes burns.
Method : Directive 67/548/EEC, Annex V, B.4.
Result : Corrosive after 3 minutes to 1 hour of exposure

Formaldehyde, polymer with benzenamine, hydrogenated:

Species : reconstructed human epidermis (RhE)
Assessment : Corrosive, category 1C - where responses occur after exposures between 1 hour and 4 hours and observations up to 14 days.
Method : OECD Test Guideline 435
Result : Corrosive after 1 to 4 hours of exposure
GLP : yes

4,4'-methylenebis(cyclohexylamine):

Species : Rabbit
Result : Corrosive after 3 minutes to 1 hour of exposure

1,3-Benzenedimethanamine, reaction products with epichlorohydrin:

Assessment : Causes burns.
Result : Causes burns.

Triethylenetetramine, propoxylated:

Species : Rabbit
Exposure time : 72 h
Method : OECD Test Guideline 404
Result : Irritating to skin.

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2,2',2''-nitrioltriethanol:

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

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Species : reconstructed human epidermis (RhE)
Assessment : Causes burns.
Method : OECD Test Guideline 435
Result : Corrosive after 3 minutes to 1 hour of exposure

Species : Rabbit
Assessment : Causes burns.
Method : OECD Test Guideline 404
Result : Corrosive after 3 minutes to 1 hour of exposure

Serious eye damage/eye irritation**Components:****m-phenylenebis(methylamine):**

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

Formaldehyde, polymer with benzenamine, hydrogenated:

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

Triethylenetetramine, propoxylated:

Species : Rabbit
Result : Eye irritation
Assessment : Irritating to eyes.

2,2',2''-nitrioltriethanol:

Species : Rabbit
Result : Normally reversible injuries
Assessment : No eye irritation
Method : OECD Test Guideline 405

trientine:

Species : Rabbit
Result : Irreversible effects on the eye
Assessment : Risk of serious damage to eyes.
Method : OECD Test Guideline 405

Respiratory or skin sensitisation**Components:****m-phenylenebis(methylamine):**

Exposure routes : Skin

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Species : Mouse
 Assessment : Probability or evidence of low to moderate skin sensitisation rate in humans
 Method : OECD Test Guideline 429
 Result : Probability or evidence of low to moderate skin sensitisation rate in humans
 GLP : yes
 Assessment : Harmful if swallowed or if inhaled., Causes severe skin burns and eye damage., Corrosive to the respiratory tract. May cause an allergic skin reaction.

Formaldehyde, polymer with benzenamine, hydrogenated:

Test Type : Buehler Test
 Exposure routes : Skin
 Species : Guinea pig
 Assessment : Probability or evidence of skin sensitisation in humans
 Method : OECD Test Guideline 406
 Result : May cause sensitisation by skin contact.
 Assessment : Causes severe skin burns and eye damage. May cause sensitisation by skin contact.

4,4'-methylenebis(cyclohexylamine):

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

1,3-Benzenedimethanamine, reaction products with epichlorohydrin:

Test Type : Maximisation Test
 Exposure routes : Intradermal
 Species : Guinea pig
 Assessment : Probability or evidence of low to moderate skin sensitisation rate in humans
 Result : Probability or evidence of low to moderate skin sensitisation rate in humans

Triethylenetetramine, propoxylated:

Exposure routes : Skin
 Method : OECD Test Guideline 429
 Result : Probability or evidence of low to moderate skin sensitisation rate in humans

2,2',2''-nitrilotriethanol:

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

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Exposure routes : Skin

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Species : Guinea pig
 Assessment : Probability or evidence of skin sensitisation in humans
 Method : OECD Test Guideline 406
 Result : Probability or evidence of skin sensitisation in humans

Germ cell mutagenicity**Components:****m-phenylenebis(methylamine):**

Genotoxicity in vitro : Test Type: Ames test
 Test system: Salmonella typhimurium
 Metabolic activation: with and without metabolic activation
 Method: OECD Test Guideline 471
 Result: negative
 GLP: yes

Test Type: Chromosome aberration test in vitro
 Test system: Chinese hamster ovary cells
 Metabolic activation: with and without metabolic activation
 Method: OECD Test Guideline 473
 Result: negative
 GLP: yes

Test Type: In vitro mammalian cell gene mutation test
 Test system: mouse lymphoma cells
 Metabolic activation: with and without metabolic activation
 Method: OECD Test Guideline 476
 Result: negative
 GLP: yes

Genotoxicity in vivo : Test Type: In vivo micronucleus test
 Species: Mouse (male and female)
 Cell type: Bone marrow
 Application Route: Oral
 Exposure time: single dose
 Dose: 750 mg/kg body weight
 Method: OECD Test Guideline 474
 Result: negative
 GLP: yes

Germ cell mutagenicity - Assessment : Tests on bacterial or mammalian cell cultures did not show mutagenic effects., Animal testing did not show any mutagenic effects.

Formaldehyde, polymer with benzenamine, hydrogenated:

Genotoxicity in vitro : Test Type: Chromosome aberration test in vitro
 Test system: Chinese hamster lung cells
 Metabolic activation: with and without metabolic activation
 Method: OECD Test Guideline 473
 Result: negative
 GLP: yes

Test Type: Ames test
 Test system: Salmonella typhimurium and E. coli
 Metabolic activation: with and without metabolic activation

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Method: OECD Test Guideline 471
Result: negative
GLP: yes

Test Type: In vitro mammalian cell gene mutation test
Test system: mouse lymphoma cells
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 476
Result: negative
GLP: yes

Germ cell mutagenicity - Assessment : In vitro tests did not show mutagenic effects

4,4'-methylenebis(cyclohexylamine):

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

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

Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 476
Result: negative

Genotoxicity in vivo : Cell type: Somatic
Application Route: Intraperitoneal injection
Dose: 50 mg/kg
Method: OECD Test Guideline 474
Result: negative

1,3-Benzenedimethanamine, reaction products with epichlorohydrin:

Genotoxicity in vitro : Test system: Salmonella typhimurium
Result: negative

Genotoxicity in vivo : Test Type: Micronucleus test
Method: OECD Test Guideline 473
Result: negative

Triethylenetetramine, propoxylated:

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

Test Type: Ames test
Test system: Salmonella typhimurium
Method: OECD Test Guideline 471
Result: positive

Test Type: Chromosome aberration test in vitro
Test system: Chinese hamster ovary cells

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Method: OECD Test Guideline 473
 Result: negative

Germ cell mutagenicity - Assessment : Tests on bacterial or mammalian cell cultures did not show mutagenic effects.

2,2',2"-nitrioltriethanol:

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

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

Concentration: 0 - 1500 µg/L
 Metabolic activation: with and without metabolic activation
 Method: OECD Test Guideline 476
 Result: negative

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Genotoxicity in vitro : Test Type: reverse mutation assay
 Test system: Salmonella tryphimurium and E. coli
 Metabolic activation: with and without metabolic activation
 Method: OECD Test Guideline 471
 Result: positive
 GLP: yes

Test Type: Micronucleus test
 Test system: Human lymphocytes
 Metabolic activation: with and without metabolic activation
 Method: OECD Test Guideline 487
 Result: negative

Genotoxicity in vivo : Test Type: In vivo micronucleus test
 Species: Mouse (male and female)
 Cell type: Bone marrow
 Application Route: Intraperitoneal injection
 Dose: 0 - 600 mg/kg
 Method: OECD Test Guideline 474
 Result: negative

Carcinogenicity**Components:****2,2',2"-nitrioltriethanol:**

Species : Rat, male and female
 Application Route : Dermal
 Exposure time : 103 weeks
 Dose : 250 mg/kg
 Frequency of Treatment : 5 daily
 Method : OECD Test Guideline 451
 Result : negative

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Species : Mouse, male
 Application Route : Dermal
 NOAEL : \geq 50 mg/kg bw/day
 Method : OECD Test Guideline 451
 Result : negative

Species : Mouse, male
 Application Route : Dermal
 Exposure time : 104 weeks
 NOAEL : \geq 20 mg/kg bw/day
 Method : OECD Test Guideline 451
 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:****m-phenylenebis(methylamine):**

Effects on fertility : Test Type: Reproduction / Developmental Toxicity Screening Test
 Species: Rat, male and female
 Application Route: Oral
 Dose: 0, 50, 150 and 450 mg/kg
 General Toxicity - Parent: NOEL: 50 - 150 mg/kg body weight
 General Toxicity F1: NOEL: 450 mg/kg body weight
 Method: OECD Test Guideline 421
 Result: No effects on fertility and early embryonic development were detected.
 GLP: yes

Effects on foetal development : Test Type: Pre-natal
 Species: Rat, female
 Strain: Sprague-Dawley
 Application Route: Oral
 Dose: 0, 30, 100, 300 mg/kg milligram per kilogram
 Duration of Single Treatment: 15 d
 Frequency of Treatment: 1 daily
 General Toxicity Maternal: NOAEL: 100 mg/kg body weight
 Developmental Toxicity: NOAEL: 300 mg/kg body weight
 Method: OECD Test Guideline 414
 Result: No effects on fertility and early embryonic development were detected.

Reproductive toxicity - Assessment : No evidence of adverse effects on sexual function and fertility, or on development, based on animal experiments.

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Formaldehyde, polymer with benzenamine, hydrogenated:

Effects on fertility : Test Type: reproductive and developmental toxicity study
Species: Rat, male and female
Application Route: Oral
Dose: 0, 70, 140 and 280 mg/kg
Frequency of Treatment: 7 days/week
General Toxicity - Parent: NOAEL: 280 mg/kg body weight
General Toxicity F1: NOAEL: > 280 mg/kg body weight
Method: OECD Test Guideline 421
Result: Animal testing did not show any effects on fertility.
GLP: yes

Effects on foetal development : Test Type: Pre-natal
Species: Rat, females
Application Route: Oral
Dose: 0/70/140/280 milligram per kilogram
Duration of Single Treatment: 15 d
Frequency of Treatment: 7 days/week
General Toxicity Maternal: NOAEL: > 280 mg/kg body weight
Developmental Toxicity: NOAEL: > 280 mg/kg body weight
Method: OECD Test Guideline 414
Result: No teratogenic effects
GLP: yes

Reproductive toxicity - Assessment : No evidence of adverse effects on sexual function and fertility, or on development, based on animal experiments.

4,4'-methylenebis(cyclohexylamine):

Effects on fertility : Species: Rat, male and female
Application Route: Oral
Method: OECD Test Guideline 422
Result: positive

Triethylenetetramine, propoxylated:

Effects on fertility : Test Type: Fertility
Species: Rat, male and female
Strain: wistar
Application Route: Ingestion
Dose: 100, 300 and 750 milligram per kilogram
General Toxicity - Parent: NOEL: Measured 750 mg/kg body weight
General Toxicity F1: NOEL: Measured 750 mg/kg body weight
Method: OECD Test Guideline 422

Effects on foetal development : Species: Rat, male and female
Strain: wistar
Application Route: Ingestion
Dose: 100, 300 and 750 milligram per kilogram
General Toxicity Maternal: NOEL: Measured 300 mg/kg body weight
Developmental Toxicity: NOAEL: Measured 750 mg/kg body weight
Method: OECD Test Guideline 422

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Reproductive toxicity - Assessment : No evidence of adverse effects on sexual function and fertility, or on development, based on animal experiments.

2,2',2''-nitrioltriethanol:

Effects on fertility : Species: Rat, male and female
Application Route: Oral
Method: OECD Test Guideline 416
Result: No effects on fertility and early embryonic development were detected.

Effects on foetal development : Species: Rat, male and female
Application Route: Oral
General Toxicity Maternal: NOAEL: > 1,000 mg/kg body weight
Method: OECD Test Guideline 421
Result: No teratogenic effects

Species: Rat
Application Route: Dermal
General Toxicity Maternal: NOAEL: 75 mg/kg body weight
Method: OECD Test Guideline 414
Result: No teratogenic effects

Species: Rabbit
Application Route: Dermal
General Toxicity Maternal: NOAEL: 10 mg/kg body weight
Method: OECD Test Guideline 414
Result: No teratogenic effects

trientine:

Effects on foetal development : Test Type: Pre-natal
Species: Rat
Application Route: Oral
Dose: 75/325/750 mg/kg bw/day
Duration of Single Treatment: 10 d
General Toxicity Maternal: NOAEL: >= 750 mg/kg body weight
Developmental Toxicity: NOAEL: >= 750 mg/kg body weight
Method: OECD Test Guideline 414
Result: No teratogenic effects

Test Type: Pre-natal
Species: Rabbit
Application Route: Dermal
Dose: 5/50/125 mg/kg bw/day
Duration of Single Treatment: 13 d
General Toxicity Maternal: NOAEL: 50 mg/kg body weight
Developmental Toxicity: NOAEL: >= 125 mg/kg body weight
Method: OECD Test Guideline 414
Result: No teratogenic effects

STOT - single exposure

No data available

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STOT - repeated exposure**Components:****Formaldehyde, polymer with benzenamine, hydrogenated:**

Exposure routes : Ingestion
Target Organs : Kidney, Liver, spleen, Adrenal gland
Assessment : The substance or mixture is classified as specific target organ toxicant, repeated exposure, category 2.

4,4'-methylenebis(cyclohexylamine):

Exposure routes : Ingestion
Target Organs : Liver
Assessment : The substance or mixture is classified as specific target organ toxicant, repeated exposure, category 2.

Triethylenetetramine, propoxylated:

Exposure routes : Ingestion
Target Organs : Kidney
Assessment : No significant health effects observed at a concentration of 300mg/kg bw/day.

Repeated dose toxicity**Components:****m-phenylenebis(methylamine):**

Species : Rat, male and female
NOEL : 150 mg/kg
Application Route : oral (gavage)
Exposure time : 28 d
Number of exposures : 7 days/week
Dose : 0, 10, 40, 150 and 600 mg/kg/d
Method : OECD Test Guideline 407
GLP : yes

Species : Rat, male and female
NOEC : 0.6 mg/m³
Application Route : Inhalation
Exposure time : 13 weeks 6 h
Number of exposures : 5 days/week
Dose : 0, 0.64, 5.1, 31 mg/m³
Method : OECD Test Guideline 413
GLP : yes
Target Organs : Lungs

Repeated dose toxicity - Assessment : Harmful if swallowed or if inhaled., Causes severe skin burns and eye damage., Corrosive to the respiratory tract.
No adverse effect has been observed in chronic toxicity tests.

Formaldehyde, polymer with benzenamine, hydrogenated:

Species : Rat, male and female
NOAEL : 15 mg/kg
Application Route : oral (gavage)
Exposure time : 28 d

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Number of exposures : once daily
Dose : 15, 150 and 300 mg/kg
Method : OECD Test Guideline 407
GLP : yes
Target Organs : Kidney, Liver, Adrenal gland, spleen
Assessment : The substance or mixture is classified as specific target organ toxicant, repeated exposure, category 2.

Repeated dose toxicity - Assessment : Causes severe skin burns and eye damage.

4,4'-methylenebis(cyclohexylamine):

Species : Rat, male and female
NOEC : 15 mg/kg, 12.2 mg/m³
Application Route : Ingestion
Test atmosphere : dust/mist
Exposure time : 864 h
Number of exposures : 7 d
Method : OECD Test Guideline 413

Triethylenetetramine, propoxylated:

Species : Rat, male and female
NOAEL : 300 mg/kg
Application Route : Ingestion
Exposure time : 43 - 44 Days
Method : OECD Test Guideline 422

2,2',2''-nitilotriethanol:

Species : Rat, male and female
NOEC : 500 mg/m³
Application Route : Inhalation
Test atmosphere : dust/mist
Exposure time : 28 d
Method : OECD Test Guideline 412
Target Organs : Respiratory Tract

Species : Rat, male and female
NOEC : 420 mg/m³
Application Route : Inhalation
Test atmosphere : dust/mist
Exposure time : 5 d
Number of exposures : 6 h/d
Method : Subacute toxicity

Species : Rat, male and female
NOAEL : 1000 mg/kg, 500 mg/m³
Application Route : Ingestion
Exposure time : 91 d
Method : OECD Test Guideline 408

Species : Rat, male and female
NOAEL : 125 - 500 mg/kg
Application Route : Skin contact
Exposure time : 90 d

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Number of exposures : 5 d/w
Method : OECD Test Guideline 411
Target Organs : Kidney

trientine:

Species : Rat, male and female
NOAEL : 350 mg/kg
Application Route : Oral
Exposure time : 28 d
Number of exposures : 7 d
Dose : 100/350/1000 mg/kg bw/day
Method : OECD Test Guideline 407
Target Organs : Lungs
Remarks : Information given is based on data obtained from similar substances.

Species : Dog, male and female
NOAEL : 125 mg/kg
Application Route : Oral
Target Organs : Lungs
Remarks : Information given is based on data obtained from similar substances.

Species : Dog, male and female
NOAEL : 50 mg/kg
Application Route : Oral
Method : Subchronic toxicity
Remarks : Information given is based on data obtained from similar substances.

Species : Rat, male and female
NOAEL : 50 mg/kg
Application Route : Oral
Exposure time : 26 weeks
Dose : 50/175/600 mg/kg bw/day
Method : OECD Test Guideline 408
Target Organs : Lungs
Remarks : Information given is based on data obtained from similar substances.

Species : Mouse, male and female
NOAEL : 92 mg/kg, 600 ppm
Application Route : Oral
Exposure time : 120/600/3000 ppm
Method : OECD Test Guideline 408
Remarks : Information given is based on data obtained from similar substances.

Aspiration toxicity

No data available

Experience with human exposure

No data available

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Toxicology, Metabolism, Distribution

No data available

Neurological effects

No data available

Further information

No data available

SECTION 12. ECOLOGICAL INFORMATION**Ecotoxicity****Components:****m-phenylenebis(methylamine):**

Toxicity to fish : LC50 (Oryzias latipes (Orange-red killifish)): 87.6 mg/l
 End point: mortality
 Exposure time: 96 h
 Test Type: semi-static test
 Test substance: Fresh water
 Method: OECD Test Guideline 203
 GLP: yes

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 15.2 mg/l
 End point: Immobilization
 Exposure time: 48 h
 Test Type: static test
 Analytical monitoring: yes
 Test substance: Fresh water
 Method: OECD Test Guideline 202
 GLP: yes

Toxicity to algae/aquatic plants : ErC50 (Selenastrum capricornutum (green algae)): 32.1 mg/l
 Exposure time: 72 h
 Test Type: static test
 Analytical monitoring: yes
 Test substance: Fresh water
 Method: OECD Test Guideline 201
 GLP: yes

NOEC (Selenastrum capricornutum (green algae)): 10.5 mg/l
 Exposure time: 72 h
 Test Type: static test
 Analytical monitoring: yes
 Test substance: Fresh water
 Method: OECD Test Guideline 201
 GLP: yes

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (Daphnia magna (Water flea)): 4.7 mg/l
 Exposure time: 21 d
 Test Type: semi-static test
 Analytical monitoring: yes
 Test substance: Fresh water
 Method: OECD Test Guideline 211
 GLP: yes

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Toxicity to microorganisms : EC50 (activated sludge): > 1,000 mg/l
Exposure time: 0.5 h
Test Type: static test
Analytical monitoring: no
Test substance: Fresh water
Method: OECD Test Guideline 209
GLP: yes

Formaldehyde, polymer with benzenamine, hydrogenated:

Toxicity to fish : LC50 (Poecilia reticulata (guppy)): 63 mg/l
End point: mortality
Exposure time: 96 h
Test Type: static test
Analytical monitoring: yes
Test substance: Fresh water
Method: OECD Test Guideline 203
GLP: yes

Toxicity to daphnia and other aquatic invertebrates : LC50 (Daphnia magna (Water flea)): 15.4 mg/l
End point: Immobilization
Exposure time: 48 h
Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 202
GLP: yes

Toxicity to algae/aquatic plants : ErC50 (Desmodesmus subspicatus (green algae)): 43.94 mg/l
Exposure time: 72 h
Test Type: static test
Test substance: Fresh water
Method: Directive 67/548/EEC, Annex V, C.3.
GLP: yes

ErC10 (Desmodesmus subspicatus (green algae)): 1.2 mg/l
Exposure time: 72 h
Test Type: static test
Test substance: Fresh water
Method: Directive 67/548/EEC, Annex V, C.3.
GLP: yes

NOECr (Desmodesmus subspicatus (green algae)): < 4 mg/l
Exposure time: 72 h
Test Type: static test
Test substance: Fresh water
Method: Directive 67/548/EEC, Annex V, C.3.
GLP: yes

Toxicity to microorganisms : EC50 (activated sludge): 186.7 mg/l
Exposure time: 3 h
Test Type: static test
Analytical monitoring: no
Method: Directive 67/548/EEC, Annex V, C.11
GLP: yes

Ecotoxicology Assessment

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

1,3-Benzenedimethanamine, reaction products with epichlorohydrin:

Toxicity to fish : LC50 (Leuciscus idus (Golden orfe)): 4 mg/l
End point: mortality
Exposure time: 96 h
Test substance: Fresh water

Toxicity to microorganisms : EC10 (Pseudomonas putida): 0.23 mg/l

Ecotoxicology Assessment

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

Triethylenetetramine, propoxylated:

Toxicity to fish : LC50 (Oncorhynchus mykiss (rainbow trout)): Measured > 4.1 mg/l
Exposure time: 96 h
Test Type: semi-static test
Analytical monitoring: yes
Method: OECD Test Guideline 203

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): Measured 48 mg/l
Exposure time: 48 h
Test Type: static test
Analytical monitoring: yes
Method: OECD Test Guideline 202

Toxicity to algae/aquatic plants : EC50 (Pseudokirchneriella subcapitata (algae)): Measured 4.1 mg/l
Exposure time: 72 h
Test Type: static test
Analytical monitoring: yes
Method: OECD Test Guideline 201

ErC10 (Pseudokirchneriella subcapitata (algae)): Measured 0.11 mg/l
Exposure time: 72 h
Test Type: static test
Analytical monitoring: yes
Method: OECD Test Guideline 201

Toxicity to microorganisms : EC10 (activated sludge): 38 mg/l
Exposure time: 3 h
Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 209

2,2',2"-nitrilotriethanol:

Toxicity to fish : LC50 (Pimephales promelas (fathead minnow)): 11,800 mg/l
Exposure time: 96 h
Test Type: flow-through test
Test substance: Fresh water

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Toxicity to daphnia and other aquatic invertebrates : EC50 (Ceriodaphnia dubia (Water flea)): 609.88 mg/l
 Exposure time: 48 h
 Test Type: static test
 Test substance: Fresh water

Toxicity to algae/aquatic plants : ErC50 (Desmodesmus subspicatus (green algae)): 512 mg/l
 Exposure time: 72 h
 Test Type: static test
 Test substance: Fresh water
 Method: DIN 38412

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (Daphnia magna (Water flea)): 16 mg/l
 Exposure time: 21 d
 Test Type: semi-static test
 Test substance: Fresh water

Toxicity to microorganisms : EC50 (activated sludge): > 1,000 mg/l
 Exposure time: 3 h
 Test Type: static test
 Test substance: Fresh water
 Method: OECD Test Guideline 209

trientine:

Toxicity to fish : LC50 (Poecilia reticulata (guppy)): 570 mg/l
 Exposure time: 96 h
 Test Type: semi-static test
 Test substance: Fresh water
 Method: Directive 67/548/EEC, Annex V, C.1.

LC50 (Leuciscus idus (Golden orfe)): 200 - 500 mg/l
 Exposure time: 96 h

LC50 (Pimephales promelas (fathead minnow)): 330 mg/l
 End point: mortality
 Exposure time: 96 h
 Test Type: static test
 Test substance: Fresh water
 Method: Fish Acute Toxicity Test

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 31.1 mg/l
 End point: Immobilization
 Exposure time: 48 h
 Test Type: static test
 Test substance: Fresh water
 Method: Directive 67/548/EEC, Annex V, C.2.

Toxicity to algae/aquatic plants : ErC50 (Selenastrum capricornutum (green algae)): 20 mg/l
 Exposure time: 72 h
 Test Type: semi-static test
 Test substance: Fresh water
 Method: OECD Test Guideline 201

EC10 (Selenastrum capricornutum (green algae)): 1.34 mg/l
 Exposure time: 72 h
 Test Type: semi-static test
 Test substance: Fresh water

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Method: OECD Test Guideline 201

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : EC10 (Daphnia magna (Water flea)): 1.9 mg/l
Exposure time: 21 d
Test Type: semi-static test

Test substance: Fresh water
Method: OECD Test Guideline 202

Toxicity to microorganisms : NOEC (Bacteria): \geq 100 mg/l
Exposure time: 28 d
Method: OECD Test Guideline 216

EC50 (Bacteria): > 100 mg/l
Exposure time: 28 h
Method: OECD Test Guideline 216

EC50 (Bacteria): 15.7 mg/l
Exposure time: 2 h
Test Type: static test
Test substance: Fresh water

NOEC (Bacteria): 1.3 mg/l
Exposure time: 2 h
Test Type: static test
Test substance: Fresh water

Toxicity to soil dwelling organisms : NOEC (Eisenia fetida (earthworms)): ca. 62.5 mg/kg
Exposure time: 56 d
Method: OECD Test Guideline 222

EC50 (Eisenia fetida (earthworms)): > 1,000 mg/kg
Exposure time: 56 d
Method: OECD Test Guideline 222

Ecotoxicology Assessment

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

Persistence and degradability**Components:****m-phenylenebis(methylamine):**

Biodegradability : aerobic
Inoculum: activated sludge, non-adapted
Concentration: 14.2 mg/l
Result: Not readily biodegradable.
Biodegradation: 49 %
Exposure time: 28 d
Method: OECD Test Guideline 301B
Test substance: Fresh water
GLP: yes

Formaldehyde, polymer with benzenamine, hydrogenated:

Biodegradability : Inoculum: activated sludge
Concentration: 100 mg/l

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Result: Not biodegradable
Biodegradation: 0 %
Exposure time: 28 d
Method: Other guidelines

Triethylenetetramine, propoxylated:

Biodegradability : Inoculum: Domestic sewage
Concentration: 100 mg/l
Result: Not readily biodegradable.
Biodegradation: 4 %
Exposure time: 28 d
Method: OECD Test Guideline 301F

Stability in water : Degradation half life (DT50): > 1 yr (25 °C) pH: 4
Method: OECD Test Guideline 111

Degradation half life (DT50): > 1 yr (25 °C) pH: 7
Method: OECD Test Guideline 111

Degradation half life (DT50): > 1 yr (25 °C) pH: 9
Method: OECD Test Guideline 111

2,2',2"-nitrilotriethanol:

Biodegradability : Inoculum: activated sludge
Concentration: 5.7 mg/l
Result: Readily biodegradable.
Biodegradation: ca. 100 %
Exposure time: 5 d

Chemical Oxygen Demand (COD) : 1600 mgO₂/g

trientine:

Biodegradability : Inoculum: activated sludge
Result: Not readily biodegradable.
Biodegradation: 0 %
Exposure time: 162 d
Method: OECD Test Guideline 301D
Test substance: Fresh water

aerobic
Inoculum: activated sludge
Dissolved organic carbon (DOC)
Result: Not inherently biodegradable.
Biodegradation: 20 %
Exposure time: 84 d
Method: OECD Test Guideline 302A
Test substance: Fresh water

Bioaccumulative potential**Components:****m-phenylenebis(methylamine):**

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Partition coefficient: n-octanol/water : log Pow: 0.18 (77 °F / 25 °C)
 pH: 10.3 - 10.4
 Method: OECD Test Guideline 107
 GLP: yes

Formaldehyde, polymer with benzenamine, hydrogenated:

Bioaccumulation : Species: Cyprinus carpio (Carp)
 Bioconcentration factor (BCF): > 18 - < 219
 Exposure time: 8 Weeks
 Temperature: 77 °F / 25 °C
 Method: OECD Test Guideline 305C
 GLP: yes
 Remarks: No bioaccumulation is to be expected (log Pow <= 4).

Partition coefficient: n-octanol/water : log Pow: 2.68 (70 °F / 21 °C)
 pH: 12.5
 Method: Partition coefficient
 GLP: yes

4,4'-methylenebis(cyclohexylamine):

Partition coefficient: n-octanol/water : log Pow: 2.03 (77 °F / 25 °C)
 Method: OECD Test Guideline 107

Triethylenetetramine, propoxylated:

Partition coefficient: n-octanol/water : log Pow: -2.42

2,2',2''-nitrioltriethanol:

Bioaccumulation : Species: Cyprinus carpio (Carp)
 Bioconcentration factor (BCF): < 3.9
 Exposure time: 42 d
 Test substance: Fresh water
 Method: flow-through test

Partition coefficient: n-octanol/water : log Pow: -2.3 (77 °F / 25 °C)
 pH: 7.1

trientine:

Partition coefficient: n-octanol/water : log Pow: -2.08 - 2.90 (68 °F / 20 °C)
 Method: QSAR

Mobility in soil**Components:****2,2',2''-nitrioltriethanol:**

Distribution among environmental compartments : Koc: 18

trientine:

Distribution among : Koc: 3162.28, log Koc: 3.5

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environmental compartments Method: OECD Test Guideline 106

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 : An environmental hazard cannot be excluded in the event of
information unprofessional handling or disposal.
Harmful to aquatic life with long lasting effects.

Components:**Triethylenetetramine, propoxylated:**

Results of PBT and vPvB : This substance is not considered to be persistent,
assessment bioaccumulating and toxic (PBT).

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.

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

| | | |
|---|---|---|
| UN/ID No. | : | UN 2735 |
| Proper shipping name | : | Amines, liquid, corrosive, n.o.s. (M-XYLYLENE DIAMINE, 4,4'- METHYLENEBISCYCLOHEXYLAMINE) |
| Class | : | 8 |
| Packing group | : | II |
| Labels | : | Corrosive |
| Packing instruction (cargo aircraft) | : | 855 |
| Packing instruction (passenger aircraft) | : | 851 |

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IMDG-Code

| | | |
|----------------------|---|---|
| UN number | : | UN 2735 |
| Proper shipping name | : | AMINES, LIQUID, CORROSIVE, N.O.S. (M-XYLYLENE DIAMINE, 4,4'- METHYLENEBISCYCLOHEXYLAMINE) |
| 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 2735 |
| Proper shipping name | : | Amines, liquid, corrosive, n.o.s. (M-XYLYLENE DIAMINE, 4,4'- METHYLENEBISCYCLOHEXYLAMINE) |
| Class | : | 8 |
| Packing group | : | II |
| Labels | : | CORROSIVE |
| ERG Code | : | 153 |
| 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**

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

| | | |
|-----------------------------|---|---|
| SARA 311/312 Hazards | : | Acute toxicity (any route of exposure) Respiratory or skin sensitisation Specific target organ toxicity (single or repeated exposure) 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) $\geq 0.1\%$, as defined by the U.S. Clean Air Act Section 112 (40 CFR 61

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California Prop. 65

WARNING: This product can expose you to chemicals including 2,2'-iminodiethanol, 4,4'-methylenedianiline, which is/are known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.

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

| | |
|-------|---|
| DSL | : This product contains one or several components listed in the Canadian NDSL. |
| AIIC | : All components are listed on the inventory, regulatory obligations/restrictions apply |
| NZIoC | : Not in compliance with the inventory |
| ENCS | : On the inventory, or in compliance with the inventory |
| KECI | : Not in compliance with the inventory |
| PICCS | : Not in compliance with the inventory |
| IECSC | : On the inventory, or in compliance with the inventory |
| TCSI | : On the inventory, or 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.

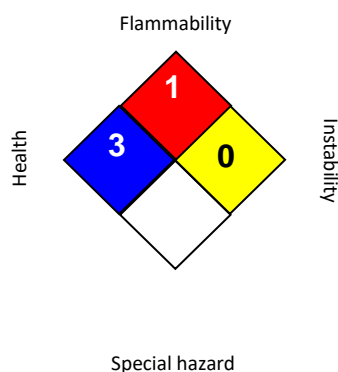
US. Toxic Substances Control Act (TSCA) Section 12(b) Export Notification (40 CFR 707, Subpt D)

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

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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 | : | 09/22/2022 |
| 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) |
| OSHA Z-1 | : | USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants |
| ACGIH / TWA | : | 8-hour, time-weighted average |
| ACGIH / C | : | Ceiling limit |
| NIOSH REL / TWA | : | Time-weighted average concentration for up to a 10-hour workday during a 40-hour workweek |
| NIOSH REL / C | : | Ceiling value not be exceeded at any time. |
| OSHA P0 / TWA | : | 8-hour time weighted average |
| OSHA P0 / C | : | Ceiling limit |
| OSHA Z-1 / TWA | : | 8-hour time weighted average |

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.

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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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