SECTION 1. IDENTIFICATION

Product name : ARALDITE® AV 1258 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 : MSDS@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 29 CFR 1910.1200
Flammable liquids : Category 4
Skin irritation : Category 2
Eye irritation : Category 2A
Skin sensitisation : Category 1
Germ cell mutagenicity : Category 2
Acute aquatic toxicity : Category 2
Chronic aquatic toxicity : Category 2

GHS label elements
Hazard pictograms : 

Signal word : Danger

Hazard statements : H227 Combustible liquid.
H315 Causes skin irritation.
H317 May cause an allergic skin reaction.
H319 Causes serious eye irritation.
H341 Suspected of causing genetic defects.
H411 Toxic to aquatic life with long lasting effects.

Precautionary statements:

**Prevention:**
P202 Do not handle until all safety precautions have been read and understood.
P210 Keep away from heat/sparks/open flames/hot surfaces.
No smoking.
P261 Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
P264 Wash skin thoroughly after handling.
P272 Contaminated work clothing should 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.
P370 + P378 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
P371 Collect spillage.

**Storage:**
P403 + P235 Store in a well-ventilated place. Keep cool.
P405 Store locked up.

**Disposal:**
P501 Dispose of contents/ container to an approved waste disposal plant.

**Other hazards**
None known.

---

**SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS**

**Substance / Mixture**: Mixture

**Hazardous components**

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>CAS-No.</th>
<th>Concentration (% w/w)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,2’-[1-methylethylidene]bis(4,1-phenyleneoxymethylene)bisoxirane</td>
<td>1675-54-3</td>
<td>30 - 50</td>
</tr>
<tr>
<td>barium sulfate</td>
<td>7727-43-7</td>
<td>10 - 20</td>
</tr>
<tr>
<td>Glass, oxide, chemicals</td>
<td>65997-17-3</td>
<td>5 - 10</td>
</tr>
<tr>
<td>aluminium</td>
<td>7429-90-5</td>
<td>5 - 10</td>
</tr>
<tr>
<td>aluminium hydroxide</td>
<td>21645-51-2</td>
<td>5 - 10</td>
</tr>
<tr>
<td>butyl 2,3-epoxypropyl ether</td>
<td>2426-08-6</td>
<td>5 - 10</td>
</tr>
</tbody>
</table>
SECTION 4. FIRST AID MEASURES

General advice
- Move out of dangerous area.
- 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.

Notes to physician
- Treat symptomatically.

SECTION 5. FIREFIGHTING MEASURES

Suitable extinguishing media
- Alcohol-resistant foam
- Carbon dioxide (CO2)
- Special powder against metal fire
- Dry chemical

Unsuitable extinguishing media
- Water
- High volume water jet

Specific hazards during firefighting
- Do not allow run-off from fire fighting to enter drains or water courses.
Specific extinguishing methods: No data is available on the product itself.

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.
- For safety reasons in case of fire, cans should be stored separately in closed containments.
- Use a water spray to cool fully closed containments.

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.
- Remove all sources of ignition.
- 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:
- Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13).
- Do not flush with water.

SECTION 7. HANDLING AND STORAGE

Advice on protection against fire and explosion:
- Do not spray on a naked flame or any incandescent material.
- Keep away from open flames, hot surfaces and sources of ignition.

Advice on safe handling:
- 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.
- Open drum carefully as content may be under pressure.
- Dispose of rinse water in accordance with local and national regulations.
- Persons susceptible to skin sensitisation problems or asthma, allergies, chronic or recurrent respiratory disease should not be employed in any process in which this mixture is being used.

Conditions for safe storage:
- No smoking.
Keep in a well-ventilated place.
Containers which are opened must be carefully reclosed and kept upright to prevent leakage.
Observe label precautions.
Keep in properly labelled containers.

Materials to avoid
Never allow product to get in contact with water during storage.

Further information on storage stability
Stable under normal conditions.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Value type (Form of exposure)</th>
<th>Control parameters / Permissible concentration</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>barium sulfate</td>
<td>7727-43-7</td>
<td>TWA (total dust)</td>
<td>15 mg/m³</td>
<td>OSHA Z-1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TWA (respirable fraction)</td>
<td>5 mg/m³</td>
<td>OSHA Z-1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TWA (Inhalable fraction)</td>
<td>5 mg/m³</td>
<td>ACGIH</td>
</tr>
<tr>
<td>aluminium</td>
<td>7429-90-5</td>
<td>TWA (total dust)</td>
<td>15 mg/m³ (Aluminium)</td>
<td>OSHA Z-1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TWA (respirable fraction)</td>
<td>5 mg/m³ (Aluminium)</td>
<td>OSHA Z-1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TWA (Respirable fraction)</td>
<td>1 mg/m³ (Aluminium)</td>
<td>ACGIH</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TWA (total dust)</td>
<td>15 mg/m³ (Aluminium)</td>
<td>OSHA Z-1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TWA (respirable fraction)</td>
<td>5 mg/m³ (Aluminium)</td>
<td>OSHA Z-1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TWA (Respirable fraction)</td>
<td>1 mg/m³ (Aluminium)</td>
<td>ACGIH</td>
</tr>
<tr>
<td>aluminium hydroxide</td>
<td>21645-51-2</td>
<td>TWA (Respirable fraction)</td>
<td>1 mg/m³ (Aluminium)</td>
<td>ACGIH</td>
</tr>
<tr>
<td>butyl 2,3-epoxypropyl ether</td>
<td>2426-08-6</td>
<td>TWA (Respirable fraction)</td>
<td>1 mg/m³ (Aluminium)</td>
<td>ACGIH</td>
</tr>
<tr>
<td>titanium dioxide</td>
<td>13463-07-7</td>
<td>TWA (total dust)</td>
<td>15 mg/m³</td>
<td>OSHA Z-1</td>
</tr>
<tr>
<td>Personal protective equipment</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>------------------------------</td>
<td>---</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Respiratory protection</td>
<td>No personal respiratory protective equipment normally required.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Respiratory protection</td>
<td>In the case of vapour formation use a respirator with an approved filter.</td>
<td></td>
<td></td>
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<tr>
<td>Hand protection</td>
<td></td>
<td></td>
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<tr>
<td>Remarks</td>
<td>The suitability for a specific workplace should be discussed with the producers of the protective gloves.</td>
<td></td>
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<tr>
<td>Eye protection</td>
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<tr>
<td></td>
<td>Eye wash bottle with pure water</td>
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<tr>
<td></td>
<td>Tightly fitting safety goggles</td>
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<tr>
<td></td>
<td>Wear face-shield and protective suit for abnormal processing problems.</td>
<td></td>
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</tr>
<tr>
<td>Skin and body protection</td>
<td>Impervious clothing</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Choose body protection according to the amount and concentration of the dangerous substance at the workplace.</td>
<td></td>
<td></td>
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<tr>
<td>Hygiene measures</td>
<td></td>
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<tr>
<td></td>
<td>When using do not eat or drink.</td>
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<td></td>
<td></td>
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<tr>
<td></td>
<td>When using do not smoke.</td>
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<td></td>
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<tr>
<td></td>
<td>Wash hands before breaks and at the end of workday.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

| Appearance | paste |
| Colour     | light grey |
| Odour      | mild |
| Odour Threshold | No data is available on the product itself. |
| pH         | No data is available on the product itself. |
| Freezing point | No data is available on the product itself. |
| Melting point | No data is available on the product itself. |
| Boiling point | No data is available on the product itself. |
| Flash point | 183 °F / 84 °C |
|             | Method: Pensky-Martens closed cup, 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: 1.62626 hPa (77 °F / 25 °C)

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

Relative density: 1.53

Density: No data is available on the product itself.

Solubility(ies)
   Water solubility: insoluble

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.

Thermal decomposition: 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.

Exhosplosive 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
   Vapours may form explosive mixture with air.
   Reacts violently with water.
   Avoid moisture.

Conditions to avoid: Heat, flames and sparks.

Incompatible materials: None known.

Hazardous decomposition products: No hazardous decomposition products are known.

SECTION 11. TOXICOLOGICAL INFORMATION
Information on likely routes of exposure

**Acute toxicity**

- **Acute oral toxicity - Product**
  - Acute toxicity estimate: > 5,000 mg/kg
  - Method: Calculation method

- **Acute inhalation toxicity - Product**
  - Acute toxicity estimate: 27.42 mg/l
  - Exposure time: 4 h
  - Test atmosphere: dust/mist
  - Method: Calculation method

**Components:**

- 2,2’-[(1-methylenebis(4,1-phenyleneoxy)methylene)]bisoxirane:
  - 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

- titanium dioxide:
  - Acute dermal toxicity: LD50 Dermal (Rabbit): > 10,000 mg/kg

- Acute toxicity (other routes of administration): No data available

**Skin corrosion/irritation**

**Components:**

- 2,2’-[(1-methylenebis(4,1-phenyleneoxy)methylene)]bisoxirane:
  - Species: Rabbit
  - Assessment: Mild skin irritant
  - Method: OECD Test Guideline 404
  - Result: Irritating to skin.

- barium sulfate:
  - Species: human skin
  - Assessment: No skin irritation
  - Result: No skin irritation

- Glass, oxide, chemicals:
  - Species: Rabbit
  - Assessment: No skin irritation
  - Method: OECD Test Guideline 404
  - Result: Normally reversible injuries

- butyl 2,3-epoxypropyl ether:
  - Species: Rabbit
  - Result: No skin irritation

- titanium dioxide:
  - Species: Rabbit
Assessment: No skin irritation
Method: OECD Test Guideline 404
Result: Normally reversible injuries

**Serious eye damage/eye irritation**

**Components:**
2,2'-(1-methylene)bis(4,1-phenyleneoxymethylene))bisoxirane:
Species: Rabbit
Result: Irritating to eyes.
Assessment: Mild eye irritant
Method: OECD Test Guideline 405

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

butyl 2,3-epoxypropyl ether:
Species: Rabbit
Result: Severe eye irritation
Assessment: Severe eye irritation

**Respiratory or skin sensitisation**

**Components:**
2,2'-(1-methylene)bis(4,1-phenyleneoxymethylene))bisoxirane:
Exposure routes: Skin
Species: Mouse
Assessment: May cause sensitisation by skin contact.
Method: OECD Test Guideline 429
Result: Causes sensitisation.

barium sulfate:
Exposure routes: Skin
Species: Mouse
Method: OECD Test Guideline 429
Result: Does not cause skin sensitisation.

Glass, oxide, chemicals:
Exposure routes: Skin
Species: Other
Result: Does not cause skin sensitisation.

butyl 2,3-epoxypropyl ether:
Result: May cause sensitisation by skin contact.

titanium dioxide:
Test Type: Local lymph node assay (LLNA)
Exposure routes: Skin
Species: Mouse
Assessment: Does not cause skin sensitisation.
Method: OECD Test Guideline 429
Result: Does not cause skin sensitisation.

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

**Components:**

titanium dioxide:
Assessment: No skin irritation, No eye irritation
Does not cause skin sensitisation,, Does not cause respiratory sensitisation.

**Germ cell mutagenicity**

**Components:**

2,2'[[1-methyleneidene]bis(4,1-phenyleneoxymethylene)]bisoxirane:
Genotoxicity in vitro: Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 476
Result: positive
Concentration: 0 - 5000 ug/plate
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: positive

barium sulfate:
Genotoxicity in vitro: Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 476
Result: negative
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

titanium dioxide:
Genotoxicity in vitro: Test Type: Ames test
Concentration: 100 - 200 ug/plate
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: negative

Test Type: In vitro mammalian cell gene mutation test:
Concentration: 31 - 500 µg/L
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 476
Result: negative

**Test Type:** Chromosome aberration test in vitro
**Concentration:** 125 - 2500 μg/L
**Metabolic activation:** with and without metabolic activation
**Method:** OECD Test Guideline 473
**Result:** negative

### Components:

2,2'-(1-methylene)bis(4,1-phenyleneoxymethylene)biscloxirane:

**Genotoxicity in vivo**
- **Cell type:** Germ
- **Application Route:** Oral
- **Method:** OECD Test Guideline 478
- **Result:** negative

- **Cell type:** Somatic
- **Application Route:** Oral
- **Dose:** 0 - 5000 mg/kg
- **Method:** OPPTS 870.5395
- **Result:** negative

**Titanium dioxide:**

**Genotoxicity in vivo**
- **Test Type:** Micronucleus test
- **Species:** Mouse (males)
- **Application Route:** Inhalation
- **Exposure time:** 5 consecutive days
- **Dose:** 0.8, 7.2, and 28.5 mg/m³
- **Method:** OECD Test Guideline 474
- **Result:** negative

- **Test Type:** Micronucleus test
- **Species:** Rat (male and female)
- **Application Route:** Oral
- **Exposure time:** once
- **Dose:** 500, 1000, and 2000 mg/kg bw
- **Method:** OECD Test Guideline 474
- **Result:** negative

### Components:

**Butyl 2,3-epoxypropyl ether:**

**Germ cell mutagenicity-Assessment**
- In vitro tests showed mutagenic effects

**Titanium dioxide:**

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

**Germ cell mutagenicity-Assessment**
- No data available

### Carcinogenicity

**Components:**
2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:
Species: Rat, male and female
Application Route: Oral
Exposure time: 24 month(s)
Dose: 15 mg/kg
Frequency of Treatment: 7 days/week
Method: OECD Test Guideline 453
Result: negative

Species: Mouse, male
Application Route: Dermal
Exposure time: 24 month(s)
Dose: 0.1 mg/kg
Frequency of Treatment: 3 days/week
Method: OECD Test Guideline 453
Result: negative

Species: Rat, female
Application Route: Dermal
Exposure time: 24 month(s)
Dose: 1 mg/kg
Frequency of Treatment: 5 days/week
Method: OECD Test Guideline 453
Result: negative

Barium sulfate:
Species: Rat, male and female
Application Route: Oral
Exposure time: 104 weeks
Dose: 60 - 75 mg/kg
Method: OPPTS 870.4200
Result: negative

Species: Mouse, male and female
Application Route: Oral
Dose: 160 - 200 mg/kg
Method: OPPTS 870.4200
Result: negative

Titanium dioxide:
Species: Rat, male and female
Application Route: Oral
Exposure time: 103 weeks
Dose: 0, 25000, 50000 ppm
Frequency of Treatment: 7 days/week
NOAEL: > 50,000 ppm

Method: No information available.
Remarks: Titanium Dioxide: based on the results of chronic inhalation studies (with positive results only in a single species - rat), IARC has concluded that: "There is inadequate evidence in humans for the carcinogenicity of titanium dioxide." but that: "There is sufficient evidence in experimental animals for carcinogenicity of titanium dioxide." IARC's overall evaluation was that "titanium dioxide is possibly carcinogenic to humans (Group 2B)."

Huntsman has examined all of the available animal carcinogenicity and mechanistic data together with workplace epidemiology data for titanium dioxide and concludes that the weight of
scientific evidence indicates that there is no causative link between titanium dioxide exposure and cancer risk in humans and that workplace exposures in compliance with applicable exposure standards will not result in lung cancer or chronic respiratory diseases in humans.

**Components:**

butyl 2,3-epoxypropyl ether: Suspected human carcinogens
Carcinogenicity -
Assessment

titanium dioxide: Not classifiable as a human carcinogen.

**IARC**

Group 2A: Probably carcinogenic to humans
Glass, oxide, chemicals
(glass)
Group 2B: Possibly carcinogenic to humans
titanium dioxide

**ACGIH**

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

**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-methylene)bis(4,1-phenyloxy)methylene)]bisoxirane:

Effects on fertility: Test Type: Two-generation study
Species: Rat, male and female
Application Route: Oral
Dose: >750 milligram per kilogram
General Toxicity - Parent: No-observed-effect level: 540 mg/kg body weight
General Toxicity F1: No-observed-effect level: 540 mg/kg body weight
Symptoms: No adverse effects
Method: OECD Test Guideline 416
Result: No effects on fertility and early embryonic development were detected.

**Components:**

2,2’-[(1-methylene)bis(4,1-phenyloxy)methylene)]bisoxirane:

Effects on foetal development: Species: Rabbit, female
Application Route: Dermal
General Toxicity Maternal: No observed adverse effect level: 30 mg/kg body weight
Method: Other guidelines
Result: No teratogenic effects
Species: Rabbit, female
Application Route: Oral
General Toxicity Maternal: No observed adverse effect level:
60 mg/kg body weight
Method: OECD Test Guideline 414
Result: No teratogenic effects

Species: Rat, female
Application Route: Oral
General Toxicity Maternal: No observed adverse effect level:
160 mg/kg body weight
Method: OECD Test Guideline 414
Result: No teratogenic effects

titanium dioxide:
Species: Rat, male and female
Application Route: Oral
Dose: 100, 300, and 1000 mg/kg bw/
Duration of Single Treatment: 20 d
Frequency of Treatment: 7 days/week
General Toxicity Maternal: No observed adverse effect level:
1,000 mg/kg body weight
Developmental Toxicity: No observed adverse effect level:
1,000 mg/kg body weight
Method: OECD Test Guideline 414
Result: No adverse effects

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

STOT - single exposure

Components:
butil 2,3-epoxypropyl ether:
Exposure routes: Inhalation
Target Organs: Respiratory Tract.
Assessment: May cause respiratory irritation.

STOT - repeated exposure
No data available

Repeated dose toxicity

Components:
2,2'-(1-methylimidazolyl)-bis(4,1-phenyl-1,3-oxazylene)bisoxirane:
Species: Rat, male and female
NOAEL: 50 mg/kg
Application Route: Ingestion
Exposure time: 14 Weeks
Number of exposures: 7 d
Method: Subchronic toxicity

Species: Rat, male and female
NOEL: 10 mg/kg
Application Route: Skin contact
Exposure time: 13 Weeks
Number of exposures: 5 d
Method: Subchronic toxicity

Species: Mouse, male
NOAEL: 100 mg/kg
Application Route: Skin contact
Exposure time: 13 Weeks
Number of exposures: 3 d
Method: Subchronic toxicity

Barium sulfate:
Species: Rat
LOEC: \( \geq 104 \) mg/kg, 40 mg/m3
Application Route: Ingestion
Test atmosphere: dust/mist
Exposure time: 5 h
Number of exposures: 5 d
Method: Subchronic toxicity

Glass, oxide, chemicals:
Species: Rat, male
LOEC: 2.4 mg/m3
Test atmosphere: dust/mist
Exposure time: 2,160 h
Number of exposures: 6 h

titanium dioxide:
Species: Rat, male and female
NOEC: 3500 mg/m3
Application Route: Ingestion
Test atmosphere: dust/mist
Exposure time: 2 yr
Number of exposures: 5 d
Method: Chronic toxicity

Species: Rat, male and female
NOEC: 10 - 50 mg/m3
Application Route: Inhalation
Exposure time: 2 yr
Number of exposures: 6 hours/day, 5 days/week
Method: Chronic toxicity

Components:
titanium dioxide:
Repeated dose toxicity - No skin irritation, No eye irritation
Assessment No adverse effect has been observed in chronic toxicity tests.

Aspiration toxicity
No data available

Experience with human exposure
General Information: No data available

Inhalation: No data available
Skin contact: No data available
Eye contact: No data available
Ingestion: No data available

Toxicology, Metabolism, Distribution
No data available

Neurological effects
No data available

Further information
Ingestion: No data available

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Components:
2,2'-[1-(methylidene)bis(4,1-phenyleneoxy)methylene]bisoxirane:
Toxicity to fish: LC50 (Oncorhynchus mykiss (rainbow trout)): 1.5 mg/l
Exposure time: 96 h
Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 203

barium sulfate:
Toxicity to fish: LC50: 174 mg/l
Exposure time: 96 h
Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 203
Glass, oxide, chemicals:
Toxicity to fish
: LC50 (Brachydanio rerio (zebrafish)): > 1,000 mg/l
  Exposure time: 96 h
  Test Type: Other guidelines
  Test substance: Fresh water
  Method: OECD Test Guideline 203

aluminium hydroxide:
Toxicity to fish
: LC50: > 10,000 mg/l
  Exposure time: 96 h

titanium dioxide:
Toxicity to fish
: LC50 (Cyprinodon variegatus (sheepshead minnow)): > 10,000 mg/l
  Exposure time: 96 h
  Test Type: semi-static test
  Test substance: Marine water
  Method: OECD Test Guideline 203

Components:
2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:
Toxicity to daphnia and other aquatic invertebrates
: EC50 (Daphnia magna (Water flea)): 2.7 mg/l
  Exposure time: 48 h
  Test Type: static test
  Test substance: Fresh water

barium sulfate:
Toxicity to daphnia and other aquatic invertebrates
: LC50 (Daphnia magna (Water flea)): 14.5 mg/l
  Exposure time: 48 h
  Test Type: static test
  Test substance: Fresh water
  Method: OECD Test Guideline 202

Glass, oxide, chemicals:
Toxicity to daphnia and other aquatic invertebrates
: EC50 (Daphnia magna (Water flea)): > 1,000 mg/l
  Exposure time: 72 h
  Test Type: semi-static test
  Test substance: Fresh water
  Method: OECD Test Guideline 202

aluminium hydroxide:
Toxicity to daphnia and other aquatic invertebrates
: EC50: > 10,000 mg/l
  Exposure time: 48 h

Components:
2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:
Toxicity to algae
: EC50 (Selenastrum capricornutum (green algae)): 9.4 mg/l
  Exposure time: 72 h
  Test Type: static test
  Test substance: Fresh water
  Method: EPA-660/3-75-009

barium sulfate:
Toxicity to algae
: EC50: > 100 mg/l
  Exposure time: 72 h
Test Type: static test  
Test substance: Fresh water  
Method: OECD Test Guideline 201

NOEC: > 1.15 mg/l  
Exposure time: 72 h  
Test Type: static test  
Test substance: Fresh water  
Method: OECD Test Guideline 201

Glass, oxide, chemicals:  
Toxicity to algae:  
EgC50 (Selenastrum capricornutum (green algae)): > 1,000 mg/l  
Exposure time: 72 h  
Test Type: semi-static test  
Method: OECD Test Guideline 201

M-Factor (Acute aquatic toxicity):  
No data available

Toxicity to fish (Chronic toxicity):  
No data available

Components:  
2,2'-(1-methylethylidene)bis(4,1-phenyleneoxy)methylene)bisoxirane:  
Toxicity to daphnia and other aquatic invertebrates:  
(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

Barium sulfate:  
Toxicity to daphnia and other aquatic invertebrates:  
(NOEC (Daphnia magna (Water flea)): 5.8 mg/l  
Exposure time: 21 d)  
Test Type: semi-static test  
Test substance: Fresh water  
Method: OECD Test Guideline 211

M-Factor (Chronic aquatic toxicity):  
No data available

Components:  
2,2'-(1-methylethylidene)bis(4,1-phenyleneoxy)methylene)bisoxirane:  
Toxicity to microorganisms:  
(IC50 (activated sludge): > 100 mg/l  
Exposure time: 3 h)  
Test Type: static test  
Test substance: Fresh water

Toxicity to soil dwelling organisms:  
No data available

Components:  
titanium dioxide:  
Plant toxicity:  
NOEC: 100,000 mg/kg
Exposure time: 480 h

**Components:**
titanium dioxide:
Sediment toxicity: (Gammarus pulex (Amphipod)): > 100000 mg/kg sediment dw
Study: Acute
Test Type: semi-static test
Water: Fresh water
Exposure duration: 28 d
Method: ASTM Method, other

(Gammarus pulex (Amphipod)): 100000 mg/kg sediment dw
Study: Chronic
Test Type: semi-static test
Water: Fresh water
Exposure duration: 28 d
Method: ASTM Method, other

(Gammarus pulex (Amphipod)): 14989 mg/kg sediment dw
Study: Acute
Test Type: semi-static test
Water: Marine water
Exposure duration: 10 d

**Components:**
titanium dioxide:
Toxicity to terrestrial organisms: NOEC: 10,000 mg/kg
Exposure time: 672 h

Ecotoxicology Assessment
Acute aquatic toxicity: No data available

**Components:**
butyl 2,3-epoxypropyl ether:
Chronic aquatic toxicity: Harmful to aquatic life with long lasting effects.

Toxicity Data on Soil: No data available

Other organisms relevant to the environment: No data available

**Persistence and degradability**

**Components:**
2,2’-[1-methylenebisd(4,1-phenyleneoxy)methylene]biscyclohexane:
Biodegradability: Inoculum: Sewage (STP effluent)
Concentration: 20 mg/l
Result: Not readily biodegradable.
Biodegradation: 5%
Exposure time: 28 d
Method: OECD Test Guideline 301F

Biochemical Oxygen: No data available
Demand (BOD)

Chemical Oxygen Demand (COD) : No data available

BOD/COD : No data available

ThOD : No data available

BOD/ThOD : No data available

Dissolved organic carbon (DOC) : No data available

Physico-chemical removability : No data available

Components:

\[ 2,2'-(1\text{-methylene})\text{bis}(4,1\text{-phenylenoxymethylene})\text{bisoxirane} \]

Stability in water:

Degradation half life (DT50): 4.83 d (77 °F / 25 °C) pH: 4
Method: OECD Test Guideline 111
Remarks: Fresh water

Degradation half life (DT50): 7.1 d (77 °F / 25 °C) pH: 9
Method: OECD Test Guideline 111
Remarks: Fresh water

Degradation half life (DT50): 3.58 d (77 °F / 25 °C) pH: 7
Method: OECD Test Guideline 111
Remarks: Fresh water

Photodegradation : No data available

Impact on Sewage Treatment : No data available

Bioaccumulative potential

Components:

\[ 2,2'-(1\text{-methylene})\text{bis}(4,1\text{-phenylenoxymethylene})\text{bisoxirane} \]

Bioaccumulation:

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

titanium dioxide:

Bioaccumulation:

Species: Oncorhynchus mykiss (rainbow trout)
Bioconcentration factor (BCF): 19 - 352
Exposure time: 14 d
Test substance: Fresh water
Method: semi-static test
Remarks: Does not bioaccumulate.

Components:

\[ 2,2'-(1\text{-methylene})\text{bis}(4,1\text{-phenylenoxymethylene})\text{bisoxirane} \]
Partition coefficient: n-octanol/water  :  log Pow: 3.242 (77 °F / 25 °C)
                          pH: 7.1
                          Method: OECD Test Guideline 117

Mobility in soil
Mobility  :  No data available

Components:
2,2'-(1-methyleneleldene)bis(4,1-phenylenoxymethylene)bisoxirane:
Distribution among environmental compartments  :  Koc: 445
Stability in soil  :  No data available

Other adverse effects
Environmental fate and pathways  :  No data available
Results of PBT and vPvB assessment  :  No data available
Endocrine disrupting potential  :  No data available
Adsorbed organic bound halogens (AOX)  :  No data available

Hazardous to the ozone layer
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 - Product  :  An environmental hazard cannot be excluded in the event of unprofessional handling or disposal. Toxic to aquatic life with long lasting effects.

Global warming potential (GWP)  :  No data available

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods
Waste from residues  :  The product should not be allowed to enter drains, water courses or the soil.
Do not contaminate ponds, waterways or ditches with chemical or used container.
Send to a licensed waste management company.
Dispose of as hazardous waste in compliance with local and
SECTION 14. TRANSPORT INFORMATION

International Regulations

IATA
UN/ID No. : UN 3062
Proper shipping name : Environmentally hazardous substance, liquid, n.o.s. (BISPHENOL A EPOXY RESIN)
Class : 9
Packing group : III
Labels : Miscellaneous
Packing instruction (cargo aircraft) : 964
Packing instruction (passenger aircraft) : 964

IMDG
UN number : UN 3062
Proper shipping name : ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (BISPHENOL A EPOXY RESIN)
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

DOT Classification
UN/ID/NA number : UN 3062
Proper shipping name : ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (BISPHENOL A EPOXY RESIN)
Class : 9
Packing group : III
Labels : CLASS 9
ARALDITE® AV 1258 US

Version 1.1 Revision Date: 06/07/2018 SDS Number: 400001012591 Date of last issue: 08/24/2016 Date of first issue: 08/24/2016

ERG Code: 171
Marine pollutant: yes(BISPHENOL A EPOXY RESIN)

Special precautions for use
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

EPCRA - Emergency Planning and Community Right-to-Know Act

SARA 311/312 Hazards: Flammable (gases, aerosols, liquids, or solids)
Skin corrosion or irritation
Serious eye damage or eye irritation
Respiratory or skin sensitisation
Germ cell mutagenicity

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 methanol, 4,4’-isopropylidenediphenol, 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:

CH INV: The formulation contains substances listed on the Swiss Inventory, On the inventory, or in compliance with the inventory

DSL: All components of this product are on the Canadian DSL
AICS: On the inventory, or in compliance with the inventory
NZIoC: Not 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
IESCC: On the inventory, or in compliance with the inventory
TCSI: On the inventory, or in compliance with the inventory
TSCA: On the inventory, or in compliance with the inventory

Inventories
AICS (Australia), DSL (Canada), IECSC (China), REACH (European Union), ENCS (Japan), ISHL (Japan), KECI (Korea), NZIoC (New Zealand), PICCS (Philippines), TCSI (Taiwan), 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.

SECTION 16. OTHER INFORMATION

Further information

NFPA 704:

HMIS® IV:

<table>
<thead>
<tr>
<th>Health</th>
<th>Flammability</th>
<th>Physical Hazard</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2</td>
<td>0</td>
</tr>
</tbody>
</table>

Revision Date: 06/07/2018

ACGIH: USA. ACGIH Threshold Limit Values (TLV)
OSHA Z-1: USA. Occupational Exposure Limits (OSHA) - Table Z-1
Limits for Air Contaminants
ACGIH / TWA: 8-hour, time-weighted average
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.

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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SECTION 1. IDENTIFICATION

Product name : HARDENER HV 1258 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 : MSDS@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 29 CFR 1910.1200
Acute toxicity (Inhalation) : Category 4
Skin corrosion : Category 1B
Serious eye damage : Category 1
Skin sensitisation : Category 1
Reproductive toxicity : Category 1B
Acute aquatic toxicity : Category 1
Chronic aquatic toxicity : Category 1

GHS label elements
Hazard pictograms :

Signal word : Danger
Hazard statements : H314 Causes severe skin burns and eye damage.
H317 May cause an allergic skin reaction.
H332 Harmful if inhaled.
H360 May damage fertility or the unborn child.
H410 Very 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 dust/ fume/ gas/ mist/ vapours/ spray.
P264 Wash skin thoroughly after handling.
P271 Use only outdoors or in a well-ventilated area.
P272 Contaminated work clothing should 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 + 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.
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**

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>CAS-No.</th>
<th>Concentration (% w/w)</th>
</tr>
</thead>
<tbody>
<tr>
<td>aluminium</td>
<td>7429-90-5</td>
<td>30 - 50</td>
</tr>
<tr>
<td>limestone</td>
<td>1317-65-3</td>
<td>20 - 30</td>
</tr>
<tr>
<td>aluminium hydroxide</td>
<td>21645-51-2</td>
<td>10 - 20</td>
</tr>
<tr>
<td>Fatty acids, C18-unsatd., dimers, reaction products with polyethylenepolyamines</td>
<td>68410-23-1</td>
<td>10 - 20</td>
</tr>
<tr>
<td>Phenol, 4-nonyl-, branched</td>
<td>84852-15-3</td>
<td>10 - 20</td>
</tr>
</tbody>
</table>
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. Do not leave the victim unattended.

If inhaled  : If unconscious, place in recovery position and seek medical advice. If symptoms persist, call a physician.

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. Protect unharmed eye. Keep eye wide open while rinsing. If eye irritation persists, consult a specialist.

If swallowed  : Keep respiratory tract clear. Do NOT induce vomiting. Do not give milk or alcoholic beverages. 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.

SECTION 5. FIREFIGHTING MEASURES

Suitable extinguishing media  : No data is available on the product itself.
Unsuitable extinguishing media: High volume water jet

Specific hazards during firefighting: Do not allow run-off from fire fighting to enter drains or water courses.

No data is available on the product itself.

Hazardous combustion products: No data is available on the product itself.

No hazardous combustion products are known.

Specific extinguishing methods: No data is available on the product itself.

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.

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: 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. To avoid spills during handling keep bottle on a metal tray. Dispose of rinse water in accordance with local and national regulations. Persons susceptible to skin sensitisation problems or asthma,
allergies, chronic or recurrent respiratory disease should not be employed in any process in which this mixture is being used.

**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. Electrical installations / working materials must comply with the technological safety standards.

**Materials to avoid**  
- Strong acids
- Strong bases
- Strong oxidizing agents

**Further information on storage stability**  
No decomposition if stored and applied as directed.

---

**SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION**

**Components with workplace control parameters**

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Value type (Form of exposure)</th>
<th>Control parameters / Permissible concentration</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>aluminium</td>
<td>7429-90-5</td>
<td>TWA (total dust)</td>
<td>15 mg/m³ (Aluminium)</td>
<td>OSHA Z-1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TWA (respirable fraction)</td>
<td>5 mg/m³ (Aluminium)</td>
<td>OSHA Z-1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TWA (Respirable fraction)</td>
<td>1 mg/m³ (Aluminium)</td>
<td>ACGIH</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TWA (total dust)</td>
<td>15 mg/m³ (Aluminium)</td>
<td>OSHA Z-1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TWA (respirable fraction)</td>
<td>5 mg/m³ (Aluminium)</td>
<td>OSHA Z-1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TWA (Respirable fraction)</td>
<td>1 mg/m³ (Aluminium)</td>
<td>ACGIH</td>
</tr>
<tr>
<td>limestone</td>
<td>1317-65-3</td>
<td>TWA (total dust)</td>
<td>15 mg/m³</td>
<td>OSHA Z-1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TWA (respirable fraction)</td>
<td>5 mg/m³ (Aluminium)</td>
<td>OSHA Z-1</td>
</tr>
<tr>
<td>aluminium hydroxide</td>
<td>21645-51-2</td>
<td>TWA (Respirable fraction)</td>
<td>1 mg/m³ (Aluminium)</td>
<td>ACGIH</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TWA (Respirable fraction)</td>
<td>1 mg/m³ (Aluminium)</td>
<td>ACGIH</td>
</tr>
</tbody>
</table>
SAFETY DATA SHEET

HARDENER HV 1258 US

Version 1.2
Revision Date: 09/20/2017
SDS Number: 400001009925
Date of last issue: 08/23/2016
Date of first issue: 08/04/2016

<table>
<thead>
<tr>
<th>Substance</th>
<th>CAS Number</th>
<th>TWA</th>
<th>Limit</th>
<th>Agency</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,2'-iminodi(ethylamine)</td>
<td>111-40-0</td>
<td>TWA (Dust)</td>
<td>20 Million particles per cubic foot (Silica)</td>
<td>OSHA Z-3</td>
</tr>
<tr>
<td>Silicon, amorphous</td>
<td>112945-52-5</td>
<td>TWA (Dust)</td>
<td>80 mg/m3 / %SiO2 (Silica)</td>
<td>OSHA Z-3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TWA (Dust)</td>
<td>20 Million particles per cubic foot (Silica)</td>
<td>OSHA Z-3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TWA (Dust)</td>
<td>80 mg/m3 / %SiO2 (Silica)</td>
<td>OSHA Z-3</td>
</tr>
<tr>
<td>quartz (SiO2)</td>
<td>14808-60-7</td>
<td>TWA (respirable)</td>
<td>10 mg/m3 / %SiO2+2</td>
<td>OSHA Z-3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TWA (respirable)</td>
<td>250 mppcf / %SiO2+5</td>
<td>OSHA Z-3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TWA (Respirable fraction)</td>
<td>0.025 mg/m3 (Silica)</td>
<td>ACGIH</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TWA (Respirable dust)</td>
<td>0.05 mg/m3</td>
<td>OSHA Z-1</td>
</tr>
<tr>
<td>carbon black</td>
<td>1333-86-4</td>
<td>TWA (Inhalable fraction)</td>
<td>3 mg/m3</td>
<td>ACGIH</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TWA</td>
<td>3.5 mg/m3</td>
<td>OSHA Z-1</td>
</tr>
</tbody>
</table>

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

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

Remarks: 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
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**: dark grey
- **Odour**: ammoniacal
- **Odour Threshold**: No data is available on the product itself.
- **pH**: No data is available on the product itself.
- **Freezing point**: No data is available on the product itself.
- **Melting point**: No data is available on the product itself.
- **Boiling point**: No data is available on the product itself.
- **Flash point**: 115 °C
  Method: Pensky-Martens closed cup, 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.
- **Burning rate**: Not combustible.
- **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**: 1.6 - 1.66
- **Density**: 1.63 g/cm³ (25 °C)
- **Solubility(ies)**
  - **Water solubility**: slightly soluble (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.
Thermal decomposition: 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 decomposition if stored and applied as directed.
Chemical stability: No decomposition if stored and applied as directed.
Possibility of hazardous reactions: No decomposition if stored and applied as directed.
Conditions to avoid: No data available

Hazardous decomposition products: Carbon oxides
Nitrogen oxides (NOx)
Burning produces noxious and toxic fumes.

SECTION 11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure: No data is available on the product itself.

Acute toxicity
Acute oral toxicity - Product: Acute toxicity estimate: > 5,000 mg/kg
Method: Calculation method

Acute inhalation toxicity - Product: Acute toxicity estimate: 2.77 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Method: Calculation method

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

Acute toxicity (other routes of administration): No data available
Skin corrosion/irritation

**Product:**
Remarks: Extremely corrosive and destructive to tissue.

Serious eye damage/eye irritation

**Product:**
Remarks: May cause irreversible eye damage.

Respiratory or skin sensitisation

**Product:**
Remarks: Causes sensitisation.

**Components:**
Phenol, 4-nonyl-, branched:
Assessment: Causes severe skin burns and eye damage.

Germ cell mutagenicity

**Components:**
Fatty acids, C18-unsatd., dimers, reaction products with polyethylenepolyamines:
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

4,4'-isopropylidenediphenol:
Genotoxicity in vitro: Metabolic activation: with and without metabolic activation
Result: negative

Silicon, amorphous:
Genotoxicity in vitro: 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

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

triethylenetetramine:
Genotoxicity in vitro: Concentration: 0 - 200 µg/L
Metabolic activation: negative
Method: OECD Test Guideline 482
Result: negative

carbon black:
Genotoxicity in vitro: Test Type: sister chromatid exchange assay
Test system: Chinese hamster ovary cells
Concentration: 0.00032-1 mg/ml
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 479
Result: negative

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

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

**Components:**

**2,2'-iminodi(ethylamine):**
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

**4,4'-isopropylidenediphenol:**
Genotoxicity in vivo: Method: OECD Test Guideline 474
Result: negative

**Silicon, amorphous:**
Genotoxicity in vivo: Application Route: Inhalation
Dose: 50 mg/m3
Result: negative

**triethylenetetramine:**
Genotoxicity in vivo: Application Route: Intraperitoneal injection
Dose: 0 - 600 mg/kg
Method: OECD Test Guideline 474
Result: negative

**carbon black:**
Genotoxicity in vivo: Test Type: in vivo assay
Species: Rat (females)
Cell type: Somatic
Application Route: Inhalation
Dose: 10 - 100 mg/kg
Result: positive

Test Type: in vivo assay
Species: Rat (females)
Components:
carbon black:
Germ cell mutagenicity-Assessment : Contains no ingredient listed as a mutagen
Germ cell mutagenicity-Assessment : No data available

Carcinogenicity
Components:
2,2'-iminodi(ethylamine):
Species: Mouse, (male)  
Application Route: Dermal
Dose: 56.3 mg/kg
Frequency of Treatment: 3 daily
Result: negative

4,4'-isopropylidenediphenol:
Species: Rat, (male and female)  
Application Route: Oral
Exposure time: 103 weeks
Frequency of Treatment: 7 daily
Result: negative

Silicon, amorphous:
Species: Rat, (male and female)  
Application Route: Oral
Exposure time: 103 weeks
Dose: 1800 - 3200 mg/kg
Frequency of Treatment: 7 daily
Method: OECD Test Guideline 453
Result: negative

triethylenetetramine:
Species: Mouse, (male)  
Application Route: Dermal
Dose: 42 mg/kg
Frequency of Treatment: 3 days/week
Method: OECD Test Guideline 451
Result: negative

Species: Mouse, (male)
Application Route: Dermal  
Exposure time: 104 weeks  
Dose: 16.8 mg/kg  
Frequency of Treatment: 3 days/week  
Method: OECD Test Guideline 451

carbon black:  
Species: Mouse, (female)  
Application Route: Inhalation  
Exposure time: 13.5 month(s)  
Dose: 7.5 - 12 mg/m³  
Frequency of Treatment: 5 daily  
Method: OECD Test Guideline 451  
Result: negative

Species: Mouse, (male and female)  
Application Route: Dermal  
Exposure time: 18 month(s)  
Frequency of Treatment: 3 daily  
Result: negative

Species: Rat, (female)  
Application Route: Oral  
Exposure time: 24 month(s)  
Dose: 52 mg/kg  
Frequency of Treatment: 7 daily  
Result: negative

Species: Rat, (male and female)  
Application Route: Inhalation  
Exposure time: 24 month(s)  
Dose: 7.5 - 12,2 mg/m³  
Frequency of Treatment: 5 daily  
Method: OECD Test Guideline 451  
Result: positive  
Target Organs: Lungs

Species: Mouse  
Application Route: Dermal  
Exposure time: 9 - 24 month(s)  
Dose: 6 - 60%  
Frequency of Treatment: 2 daily  
Method: OECD Test Guideline 451  
Result: negative

Species: Mouse, (male and female)  
Application Route: Oral  
Exposure time: 12 - 18 month(s)  
Dose: 10%  
Frequency of Treatment: 7 daily  
Result: negative

Species: Rat, (male and female)  
Application Route: Inhalation  
Exposure time: 24 month(s)  
Dose: 2.5 mg/m³
Frequency of Treatment: 16 hr/day, 5 d/wk
Method: OECD Test Guideline 451
Result: positive
Target Organs: Lungs

Components:
carbon black:
Carcinogenicity - Assessment: Weight of evidence does not support classification as a carcinogen. Tumours produced in rats on inhalation of very high concentrations are believed to be the result of prolonged "lung overload" and are not considered relevant to man.

IARC
Group 1: Carcinogenic to humans
quartz (SiO2)
Group 2B: Possibly carcinogenic to humans
carbon black

ACGIH
Suspected human carcinogen
quartz (SiO2)
Confirmed animal carcinogen with unknown relevance to humans
carbon black

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:
Fatty acids, C18-unsatd., dimers, reaction products with polyethylenepolyamines:
Effects on fertility: Species: Rat, male and female
Application Route: Other
General Toxicity - Parent: No observed adverse effect level: 1,000 mg/kg body weight
Method: OECD Test Guideline 422
Result: Animal testing did not show any effects on fertility.

2,2'-iminodi(ethylamine):
Species: Rat, male and female
Application Route: Oral
General Toxicity - Parent: No observed adverse effect level: 30 mg/kg wet weight
Method: OECD Test Guideline 421
Result: positive
4,4'-isopropylidenediphenol:
Species: Rat, male and female
Application Route: Oral
Method: OECD Test Guideline 416
Result: Embryotoxic effects and adverse effects on the offspring were detected.

Components:
Phenol, 4-nonyl-, branched:
Effects on foetal development:
Species: Rat, female
Application Route: Oral
General Toxicity Maternal: No observed adverse effect level: 75 mg/kg body weight
Method: OECD Test Guideline 414
Result: No teratogenic effects

2,2'-iminodi(ethylamine):
Species: Rat
Application Route: Oral
General Toxicity Maternal: No observed adverse effect level: 100 mg/kg body weight
Method: OECD Test Guideline 421
Result: No adverse effects

4,4'-isopropylidenediphenol:
Species: Rat, female
Application Route: Oral
General Toxicity Maternal: No observed adverse effect level: < 160 mg/kg body weight
Method: OECD Test Guideline 416
Result: No teratogenic effects

Silicon, amorphous:
Species: Mouse
Application Route: Oral
General Toxicity Maternal: No observed adverse effect level: 1,340 mg/kg body weight
Method: OECD Test Guideline 414
Result: No teratogenic effects

Species: Rabbit
Application Route: Oral
General Toxicity Maternal: No observed adverse effect level: 1,600 mg/kg body weight
Method: OECD Test Guideline 414
Result: No teratogenic effects

Species: Rat
Application Route: Oral
General Toxicity Maternal: No observed adverse effect level: 1,350 mg/kg body weight
Method: OECD Test Guideline 414
Result: No teratogenic effects
triethylenetetramine:
Species: Rat
Application Route: Oral
General Toxicity Maternal: No observed adverse effect level:
> 750 mg/kg body weight
Method: OECD Test Guideline 414
Result: No teratogenic effects

Species: Rabbit
Application Route: Dermal
General Toxicity Maternal: No observed adverse effect level:
125 mg/kg body weight
Method: OECD Test Guideline 414
Result: No teratogenic effects

**Components:**
Phenol, 4-nonyl-, branched:
Reproductive toxicity - Assessment: Suspected human reproductive toxicant

4,4'-isopropylidenediphenol:
Reproductive toxicity - Assessment: Clear evidence of adverse effects on sexual function and fertility, based on animal experiments.

**STOT - single exposure**

**Components:**
2,2'-iminodi(ethylamine):
Target Organs: Respiratory Tract
Assessment: May cause respiratory irritation.

4,4'-isopropylidenediphenol:
Assessment: The substance or mixture is classified as specific target organ toxicant, single exposure, category 3 with respiratory tract irritation.

**STOT - repeated exposure**

**Components:**
carbon black:
Assessment: The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

**Repeated dose toxicity**

**Components:**
Fatty acids, C18-unsatd., dimers, reaction products with polyethylenepolyamines:
Species: Rat, male and female
NOAEL: 1000 mg/kg
Application Route: Ingestion
Exposure time: 6 Weeks
Number of exposures: 7 d
Method: Subchronic toxicity
Phenol, 4-nonyl-, branched:
Species: Rat, male and female
NOAEL: 100 mg/kg
Application Route: Ingestion
Exposure time: 672 h
Number of exposures: 7 d
Method: Subacute toxicity

Species: Rat, male and female
NOAEL: 50 mg/kg
Application Route: Ingestion
Exposure time: 2,160 h
Number of exposures: 7 d
Method: Subchronic toxicity

2,2'-iminodi(ethyamine):
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

4,4'-isopropylidenediphenol:
Species: Dog, male and female
NOEC: 75 mg/kg, 10 mg/m3
Application Route: Ingestion
Test atmosphere: dust/mist
Exposure time: 2,160 h
Number of exposures: 7 d
Method: Subchronic toxicity

Species: Rat, male and female
LOAEL: 600 mg/kg
Application Route: Ingestion
Exposure time: 672 h
Number of exposures: 7 d
Method: Subchronic toxicity

Silicon, amorphous:
Species: Rat, male and female
NOAEL: 7950 - 8980 mg/kg
Application Route: Ingestion
Exposure time: 4,320 h
Number of exposures: 7 d  
Method: Subchronic toxicity

Species: Rat, male and female  
NOEC: 4000 - 4500 mg/m3  
Application Route: Ingestion  
Test atmosphere: dust/mist  
Exposure time: 13 Weeks  
Number of exposures: 7 d  
Method: OECD Test Guideline 413

Triethylenetetramine:  
Species: Rat, male and female  
NOAEL: 50 mg/kg/d  
Application Route: Ingestion  
Exposure time: 26 Weeks  
Number of exposures: 7 d  
Method: Subchronic toxicity

carbon black:  
Species: Mouse, male and female  
NOEL: > 100000 mg/kg  
Application Route: oral (feed)  
Exposure time: 12 - 18 months  
Number of exposures: continuously  
Species: Rat, females  
NOEL: 52 mg/kg  
Application Route: oral (feed)  
Exposure time: 52 Weeks  
Number of exposures: Continuously  
Dose: 2.05 g/kg

Species: Mouse, females  
NOEL: 137 mg/kg  
Application Route: oral (feed)  
Exposure time: 52 Weeks  
Number of exposures: Continuously  
Dose: 2.05 g/kg  
Method: OECD Test Guideline 413

Species: Rat, male and female  
LOEC: 2.5 mg/m3  
Application Route: inhalation (dust/mist/fume)  
Exposure time: 24 Months  
Number of exposures: 16 h/day, 5 days/wk  
Dose: 2.5 or 6.5 mg/m3  
Method: OECD Test Guideline 452  
Target Organs: Lungs

Species: Mouse, male and female  
Application Route: Dermal  
Number of exposures: 3 times/week  
Dose: 20%
Symptoms: see user defined free text

**Components:**
Phenol, 4-nonyl-, branched:
Repeated dose toxicity - Assessment: Causes severe skin burns and eye damage.
Aspiration toxicity
No data available

**Experience with human exposure**
General Information: No data available

Inhalation: No data available
Skin contact: No data available
Eye contact: No data available
Ingestion: No data available

**Toxicology, Metabolism, Distribution**
No data available

**Neurological effects**
No data available

**Further information**

**Product:**
Remarks: No data available

---

**SECTION 12. ECOLOGICAL INFORMATION**

**Ecotoxicity**

**Components:**
limestone:
Toxicity to fish: LC50: > 56,000 mg/l
Exposure time: 96 h

aluminium hydroxide:
Toxicity to fish: LC50: > 10,000 mg/l
Exposure time: 96 h
Fatty acids, C18-unsatd., dimers, reaction products with polyethylene polyamines:
Toxicity to fish : LC50: 7.07 mg/l
Exposure time: 96 h
Test Type: semi-static test
Test substance: Fresh water
Method: OECD Test Guideline 203

Phenol, 4-nonyl, branched:
Toxicity to fish : LC50 (Pimephales promelas (fathead minnow)): 0.128 mg/l
Exposure time: 96 h
Test Type: flow-through test
Test substance: Fresh water
Method: ASTM Method, other

LC50 (Lepomis macrochirus (Bluegill sunfish)): 0.209 mg/l
Exposure time: 96 h
Test Type: flow-through test
Test substance: Fresh water
Method: ASTM Method, other

LC50 (Oncorhynchus mykiss (rainbow trout)): 0.221 mg/l
Exposure time: 96 h
Test Type: flow-through test
Test substance: Fresh water
Method: ASTM Method, other

2,2’-iminodi(ethylamine):
Toxicity to fish : LC50: 430 mg/l
Exposure time: 96 h
Test Type: semi-static test
Test substance: Fresh water

4,4’-isopropylidenediphenol:
Toxicity to fish : LC50 (Oncorhynchus mykiss (rainbow trout)): 7.5 mg/l
Exposure time: 96 h

Silicon, amorphous:
Toxicity to fish : LL50 (Brachydano rerio (zebrafish)): > 10,000 mg/l
Exposure time: 96 h
Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 202

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

carbon black:
Toxicity to fish : LC50: > 1,000 mg/l
Exposure time: 96 h
Method: OECD Test Guideline 203
## Components:

<table>
<thead>
<tr>
<th>Material</th>
<th>Toxicity to daphnia and other aquatic invertebrates</th>
<th>EC50</th>
<th>Exposure time</th>
<th>Test Type</th>
<th>Test substance</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>aluminium hydroxide</td>
<td>:</td>
<td>EC50: &gt; 10,000 mg/l</td>
<td>48 h</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fatty acids, C18-unsatd., dimers, reaction products with polyethylenepolyamines</td>
<td>:</td>
<td>EC50 (Daphnia magna (Water flea)): 5.18 mg/l</td>
<td>1,152 h</td>
<td>static test</td>
<td>Fresh water</td>
<td>OECD Test Guideline 202</td>
</tr>
<tr>
<td>Phenol, 4-nonyl-, branched</td>
<td></td>
<td></td>
<td></td>
<td>static test</td>
<td>Fresh water</td>
<td>ASTM Method, other</td>
</tr>
<tr>
<td>2,2'-iminodi(ethylamine)</td>
<td>:</td>
<td>EC50 (Daphnia magna (Water flea)): 32 mg/l</td>
<td>48 h</td>
<td>static test</td>
<td>Fresh water</td>
<td></td>
</tr>
<tr>
<td>4,4'-isopropylidenediphenol</td>
<td>:</td>
<td>EC50: 3.9 - 10.2 mg/l</td>
<td>48 h</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Silicon, amorphous</td>
<td>:</td>
<td>EL50 (Daphnia magna (Water flea)): &gt;= 1,000 mg/l</td>
<td>24 h</td>
<td>static test</td>
<td>Fresh water</td>
<td>OECD Test Guideline 202</td>
</tr>
<tr>
<td>carbon black</td>
<td>:</td>
<td>EC50 (Daphnia magna (Water flea)): &gt; 5,600 mg/l</td>
<td>24 h</td>
<td></td>
<td></td>
<td>OECD Test Guideline 202</td>
</tr>
</tbody>
</table>
Components:

Fatty acids, C18-unsatd., dimers, reaction products with polyethylene polyamines:

Toxicity to algae: ErC50 (Selenastrum capricornutum (green algae)): 4.11 mg/l
Exposure time: 72 h
Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 201

Phenol, 4-nonyl-, branched:

Toxicity to algae: EbC50 (Desmodesmus subspicatus (green algae)): 1.3 mg/l
Exposure time: 72 h
Test Type: static test
Test substance: Fresh water
ErC50 (Selenastrum capricornutum (green algae)): 0.41 mg/l
Exposure time: 96 h
Test Type: static test
Test substance: Fresh water
Method: Algal Toxicity, Tiers I and II

2,2'-iminodi(ethylamine):

Toxicity to algae: 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

4,4'-isopropylidenediphenol:

Toxicity to algae: EC50 (Selenastrum capricornutum (green algae)): 2.5 - 3.1 mg/l
Exposure time: 96 h

Silicon, amorphous:

Toxicity to algae: EL50 (Desmodesmus subspicatus (green algae)): > 10,000 mg/l
Exposure time: 72 h
Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 201

triethylenetetramine:

Toxicity to algae: 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

carbon black:

Toxicity to algae: ErC50: > 10,000 mg/l
Exposure time: 72 h

Components:

Phenol, 4-nonyl-, branched:
M-Factor (Acute aquatic): 10
Components:
Phenol, 4-nonyl-, branched:
Toxicity to fish (Chronic toxicity):
  NOEC (Oncorhynchus mykiss (rainbow trout)): 0.006 mg/l
  Exposure time: 91 d
  Test Type: flow-through test
  Test substance: Fresh water

2,2'-iminodi(ethylamine):
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

4,4'-isopropylidenediphenol:
Toxicity to fish (Chronic toxicity):
  NOEC (Pimephales promelas (fathead minnow)): 0.016 mg/l
  Exposure time: 444 d
  Test Type: flow-through test
  Test substance: Fresh water
  Method: Fish Life Cycle Toxicity
  Remarks: Toxic to aquatic organisms.

Components:
limestone:
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity):
  EC50 (Daphnia magna (Water flea)): > 350 mg/l
  Exposure time: 125 d
  Test Type: semi-static test
  Test substance: Fresh water

2,2'-iminodi(ethylamine):
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

Triethylenetetramine:
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

Components:
4,4'-isopropylidenediphenol:
M-Factor (Chronic aquatic toxicity):
  1

Components:
Fatty acids, C18-unsatd., dimers, reaction products with polyethylene polyamines:
Toxicity to microorganisms:
  EC0: > 100 mg/l
  Method: DIN 38412
Phenol, 4-nonyl-, branched:
Toxicity to microorganisms: EC50 (activated sludge): 950 mg/l
Exposure time: 3 h
Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 209

triethylenetetramine:
Toxicity to microorganisms: EC50 (activated sludge): 800 mg/l
Exposure time: 0.5 h
Test Type: static test
Test substance: Fresh water

carbon black:
Toxicity to microorganisms: IC0: > 800 mg/l
Exposure time: 3 h
Method: No information available.

Components:
Phenol, 4-nonyl-, branched:
Toxicity to soil dwelling organisms: EC10: 3.44 mg/kg
Exposure time: 504 h
EC50 (Other): 906.7 mg/kg
Exposure time: 4 Weeks
Test substance: Synthetic

2,2’-imino(ethylamine):
Toxicity to soil dwelling organisms: EC50 (Eisenia fetida (earthworms)): > 1,000 mg/kg
Exposure time: 56 d
Test substance: Synthetic

Plant toxicity: No data available
Sediment toxicity: No data available

Components:
Phenol, 4-nonyl-, branched:
Toxicity to terrestrial organisms: EC10: 63.2 mg/kg
Exposure time: 672 h
Test substance: Synthetic

Ecotoxicology Assessment

Components:
Fatty acids, C18-unsatd., dimers, reaction products with polyethylenepolyamines:
Acute aquatic toxicity: This product has no known ecotoxicological effects.

2,2’-imino(ethylamine):
Acute aquatic toxicity: This product has no known ecotoxicological effects.

Components:
4,4’-isopropyldenediphenol:
Chronic aquatic toxicity: Toxic to aquatic life with long lasting effects.
Toxicity Data on Soil: No data available

Other organisms relevant to the environment: No data available

Persistence and degradability

Components:
- Fatty acids, C18-unsatd., dimers, reaction products with polyethylenepolyamines:
  - Biodegradability: Inoculum: activated sludge
  - Concentration: 9 mg/l
  - Result: Inherently biodegradable.
  - Biodegradation: 100 %
  - Exposure time: 74 d
  - Method: OECD Test Guideline 301B

- Phenol, 4-nonyl-, branched:
  - Biodegradability: Inoculum: activated sludge
  - Concentration: 13 mg/l
  - Result: Inherently biodegradable.
  - Biodegradation: ca. 48.2 %
  - Exposure time: 35 d
  - Method: OECD Test Guideline 301B

- 2,2'-iminodi(ethylamine):
  - Biodegradability: Inoculum: activated sludge
  - Result: Readily biodegradable.
  - Biodegradation: 87 %
  - Exposure time: 21 d
  - Method: OECD Test Guideline 301D

- 4,4'-isopropylidenediphenol:
  - Biodegradability: Result: Not readily biodegradable.
  - Biodegradation: 1 - 2 %
  - Exposure time: 28 d

- triethylenetetramine:
  - Biodegradability: Inoculum: activated sludge
  - Result: Not readily biodegradable.
  - Biodegradation: 0 %
  - Exposure time: 162 d
  - Method: OECD Test Guideline 301D
Inoculum: activated sludge
Result: Not readily biodegradable.
Biodegradation: 20 %
Exposure time: 84 d
Method: Inherent Biodegradability: Modified SCAS Test

carbon black:
Biodegradability: Result: Not readily biodegradable.
Biodegradation: < 60 %
Exposure time: 28 d

Biochemical Oxygen Demand (BOD):
Biodegradability: No data available

Chemical Oxygen Demand (COD):
Biodegradability: No data available

BOD/COD:
Biodegradability: No data available

ThOD:
Biodegradability: No data available

BOD/ThOD:
Biodegradability: No data available

Dissolved organic carbon (DOC):
Biodegradability: No data available

Physico-chemical removability:
Biodegradability: No data available

Stability in water:
Biodegradability: No data available

**Components:**

2,2’-iminodi(ethylamine):
Photodegradation:
Test Type: Air
Rate constant: 500000
Degradation (direct photolysis): 50 %

Impact on Sewage Treatment:
Biodegradability: No data available

**Bioaccumulative potential**

**Components:**

Fatty acids, C18-unsatd., dimers, reaction products with polyethylenepolyamines:
Bioaccumulation:
Bioconcentration factor (BCF): 1.85 - 2.69
Test substance: Fresh water

Phenol, 4-nonyl-, branched:
Bioaccumulation:
Species: Lepomis macrochirus (Bluegill sunfish)
Bioconcentration factor (BCF): 231
Remarks: Does not bioaccumulate.
Species: Pimephales promelas (fathead minnow)
Bioconcentration factor (BCF): 740
Remarks: Bioaccumulation is unlikely.

2,2'-iminodi(ethylamine):
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.

carbon black:
Bioaccumulation : Bioconcentration factor (BCF): 1

Components:
limestone:
Partition coefficient: n-octanol/water : log Pow: < 1

Phenol, 4-nonyl-, branched:
Partition coefficient: n-octanol/water : log Pow: 5.4 (23 °C)
PH: 5.7
Method: OECD Test Guideline 117

2,2'-iminodi(ethylamine):
Partition coefficient: n-octanol/water : log Pow: -1.58 (20 °C)
PH: 7

triethylenetetramine:
Partition coefficient: n-octanol/water : log Pow: -2.65 (20 °C)
Method: OECD Test Guideline 117

Mobility in soil
Mobility : No data available

Components:
Phenol, 4-nonyl-, branched:
Distribution among environmental compartments : Koc: 23000 - 489000

2,2'-iminodi(ethylamine):
Distribution among environmental compartments : Koc: 19111

triethylenetetramine:
Distribution among environmental compartments : Koc: 1584.9 - 5012
Method: OECD Test Guideline 106

Stability in soil : No data available

Other adverse effects
Environmental fate and pathways : No data available

Results of PBT and vPvB : No data available
SAFETY DATA SHEET

HARDENER HV 1258 US

Version 1.2
Revision Date: 09/20/2017
SDS Number: 400001009925
Date of last issue: 08/23/2016
Date of first issue: 08/04/2016

assessment

Endocrine disrupting potential : No data available

Adsorbed organic bound halogens (AOX) : No data available

Hazardous to the ozone layer
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

Additional ecological information - Product : An environmental hazard cannot be excluded in the event of
unprofessional handling or disposal.
Very toxic to aquatic life.
Toxic to aquatic life with long lasting effects.

Global warming potential (GWP) : No data available

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods
Waste from residues : The product should not be allowed to enter drains, water
courses or the soil.
Do not contaminate ponds, waterways or ditches with
chemical or used container.
Send to a licensed waste management company.

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

SECTION 14. TRANSPORT INFORMATION

International Regulations

IATA
UN/ID No. : UN 1760
Proper shipping name : Corrosive liquid, n.o.s.
(NONYL PHENOL, DIETHYLENE TRIAMINE)
Class : 8
Packing group : II
Labels : Corrosive
Packing instruction (cargo aircraft): 855
Packing instruction (passenger aircraft): 851

IMDG
UN number: UN 1760
Proper shipping name: CORROSIVE LIQUID, N.O.S. (NONYL PHENOL, DIETHYLENE TRIAMINE)
Class: 8
Packing group: II
Labels: 8
EmS Code: F-A, S-B
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

DOT Classification
UN/ID/NA number: UN 1760
Proper shipping name: CORROSIVE LIQUIDS, N.O.S. (NONYL PHENOL, DIETHYLENE TRIAMINE)
Class: 8
Packing group: II
Labels: CORROSIVE
ERG Code: 154
Marine pollutant: yes

SECTION 15. REGULATORY INFORMATION

EPCRA - Emergency Planning and Community Right-to-Know Act

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

SARA 313: The following components are subject to reporting levels established by SARA Title III, Section 313:

<table>
<thead>
<tr>
<th>Component</th>
<th>Concentration</th>
<th>Year</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>4,4'-isopropylidenediphenol</td>
<td>80-05-7</td>
<td></td>
<td>3.33 %</td>
</tr>
</tbody>
</table>

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 4,4'-isopropylidenediphenol, 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:

**CH INV**: The formulation contains substances listed on the Swiss Inventory, Not in compliance with the inventory

**DSL**: This product contains one or several components listed in the Canadian NDSL.

**AICS**: On the inventory, or in compliance with the inventory

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

**Inventories**

- AICS (Australia), DSL (Canada), IECSC (China), REACH (European Union), ENCS (Japan), ISHL (Japan), KECl (Korea), NZIoC (New Zealand), PICCS (Philippines), TCSI (Taiwan), TSCA (USA)

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

This product is subject under TSCA 5(a) to Significant New Use Restrictions (SNUR).

- Phenol, 4-nonyl- branched 84852-15-3

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

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

- Phenol, 4-nonyl- branched 84852-15-3
SECTION 16. OTHER INFORMATION

Further information

NFPA:

FLAMMABILITY

PHYSICAL HAZARD

HEALTH

Special hazard.

HMIS® IV:

HEALTH

* 3

FLAMMABILITY

1

PHYSICAL HAZARD

1

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 : 09/20/2017

ACGIH : USA. ACGIH Threshold Limit Values (TLV)
OSHA Z-1 : USA. Occupational Exposure Limits (OSHA) - Table Z-1
          : Limits for Air Contaminants
OSHA Z-3 : USA. Occupational Exposure Limits (OSHA) - Table Z-3
          : Mineral Dusts
ACGIH / TWA : 8-hour, time-weighted average
OSHA Z-1 / TWA : 8-hour time weighted average
OSHA Z-3 / 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.

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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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