

**ARALDITE® 2023-10 RESIN**

Version 1.0      Revision Date: 02/19/2019      SDS Number: 400000007335      Date of last issue: -  
Date of first issue: 02/19/2019

**SECTION 1. IDENTIFICATION**

Product name : ARALDITE® 2023-10 RESIN

**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 : SDS@huntsman.com  
Emergency telephone number : Chemtrec: (800) 424-9300 or (703) 527-3887

**Recommended use of the chemical and restrictions on use**

Recommended use : Resin

**SECTION 2. HAZARDS IDENTIFICATION****GHS classification in accordance with 29 CFR 1910.1200**

Flammable liquids : Category 2  
Skin irritation : Category 2  
Eye irritation : Category 2A  
Skin sensitisation : Category 1  
Specific target organ toxicity - single exposure : Category 3 (Respiratory system)  
Short-term (acute) aquatic hazard : Category 3

**GHS label elements**

Hazard pictograms : 

Signal word : Danger

Hazard statements : H225 Highly flammable liquid and vapour.  
H315 Causes skin irritation.  
H317 May cause an allergic skin reaction.  
H319 Causes serious eye irritation.

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H335 May cause respiratory irritation.  
H402 Harmful to aquatic life.

## Precautionary statements

: **Prevention:**

P210 Keep away from heat/sparks/open flames/hot surfaces.  
No smoking.  
P233 Keep container tightly closed.  
P240 Ground/bond container and receiving equipment.  
P241 Use explosion-proof electrical/ ventilating/ lighting equipment.  
P242 Use only non-sparking tools.  
P243 Take precautionary measures against static discharge.  
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 must not be allowed out of the workplace.  
P273 Avoid release to the environment.  
P280 Wear protective gloves/ eye protection/ face protection.

**Response:**

P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.  
P304 + P340 + P312 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor if you feel unwell.  
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.  
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.

**Storage:**

P403 + P233 Store in a well-ventilated place. Keep container tightly closed.  
P403 + P235 Store in a well-ventilated place. Keep cool.  
P405 Store locked up.

**Disposal:**

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

**Other hazards**

None known.

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

Substance / Mixture : Mixture

**Hazardous components**

Chemical name	CAS-No.	Concentration (% w/w)
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methyl methacrylate	80-62-6	30 - 50
titanium dioxide	13463-67-7	5 - 10
Silicon, amorphous	7631-86-9	1 - 5
octadecyl methacrylate	32360-05-7	1 - 5
methacrylic acid	79-41-4	1 - 2.5
hexadecyl methacrylate	2495-27-4	1 - 5
Talc (Mg <sub>3</sub> H <sub>2</sub> (SiO <sub>3</sub> ) <sub>4</sub> )	14807-96-6	0.1 - 1
2,6-di-tert-butyl-p-cresol	128-37-0	0.1 - 0.25

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.  
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 : Keep respiratory tract clear.  
Never give anything by mouth to an unconscious person.  
If symptoms persist, call a physician.
- 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 (CO<sub>2</sub>)  
Dry chemical
- Unsuitable extinguishing media : High volume water jet

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- Specific hazards during firefighting : Do not allow run-off from fire fighting to enter drains or water courses.
- Hazardous combustion products : Carbon oxides
- 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 containers.
- 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.  
Remove all sources of ignition.  
Evacuate personnel to safe areas.  
Refer to protective measures listed in sections 7 and 8.  
Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.
- 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).

**SECTION 7. HANDLING AND STORAGE**

- Advice on protection against fire and explosion : Do not spray on a naked flame or any incandescent material.  
Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapours).  
Use only explosion-proof equipment.  
Keep away from open flames, hot surfaces and sources of ignition.
- Advice on safe handling : Avoid formation of aerosol.  
Do not breathe vapours or spray mist.  
Avoid exposure - obtain special instructions before use.  
Avoid contact with skin and eyes.

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For personal protection see section 8.  
Smoking, eating and drinking should be prohibited in the application area.  
Take precautionary measures against static discharges.  
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 container tightly closed in a dry and well-ventilated place.  
Containers which are opened must be carefully resealed and kept upright to prevent leakage.  
Observe label precautions.  
Keep in properly labelled containers.
- Materials to avoid : For incompatible materials please refer to Section 10 of this SDS.
- Recommended storage temperature : 36 - 46 °F / 2 - 8 °C
- Further information on storage stability : Stable under normal conditions.

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

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
methyl methacrylate	80-62-6	TWA	50 ppm	ACGIH
		STEL	100 ppm	ACGIH
titanium dioxide	13463-67-7	TWA	100 ppm 410 mg/m <sup>3</sup>	OSHA Z-1
		TWA (total dust)	15 mg/m <sup>3</sup>	OSHA Z-1
Silicon, amorphous	7631-86-9	TWA	10 mg/m <sup>3</sup> (Titanium dioxide)	ACGIH
		TWA (Dust)	20 Million particles per cubic foot (Silica)	OSHA Z-3
		TWA (Dust)	80 mg/m <sup>3</sup> / %SiO <sub>2</sub> (Silica)	OSHA Z-3
		TWA (Dust)	20 Million particles per cubic foot (Silica)	OSHA Z-3

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		TWA (Dust)	80 mg/m <sup>3</sup> / %SiO <sub>2</sub> (Silica)	OSHA Z-3
		TWA	6 mg/m <sup>3</sup> (Silica)	NIOSH REL
methacrylic acid	79-41-4	TWA	20 ppm	ACGIH
2,6-di-tert-butyl-p-cresol	128-37-0	TWA (Inhalable fraction and vapor)	2 mg/m <sup>3</sup>	ACGIH

**Personal protective equipment**

- Respiratory protection : In the case of vapour formation use a respirator with an approved filter.
- Filter type : Combined particulates and organic vapour type
- Hand protection
- 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 concentration of the dangerous substance at the work place.
- Hygiene measures : When using do not eat or drink.  
When using do not smoke.  
Wash hands before breaks and at the end of workday.

**SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES**

- Appearance : paste
- Colour : white
- 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.
- Freezing point : No data is available on the product itself.
- Melting point : No data is available on the product itself.
- Boiling point : ca. > 212 °F / > 100 °C  
Method: estimated
- Flash point : 52 °F / 11 °C

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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	:	1.07 g/cm <sup>3</sup> Method: Calculation method
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	:	> 752 °F / > 400 °C Method: estimated
Decomposition temperature	:	> 392 °F / > 200 °C Method: estimated
Self-Accelerating decomposition temperature (SADT)	:	No data is available on the product itself.
Viscosity		
Viscosity, dynamic	:	180,000 - 200,000 mPa.s Method: estimated
Explosive properties	:	No data is available on the product itself.
Oxidizing properties	:	No data is available on the product itself.
Particle size	:	No data is available on the product itself.

**SECTION 10. STABILITY AND REACTIVITY**

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

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Possibility of hazardous reactions : Vapours may form explosive mixture with air.

Conditions to avoid : Heat, flames and sparks.

Incompatible materials : None known.

Hazardous decomposition products : carbon dioxide  
carbon monoxide

**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: 55.83 mg/l  
Exposure time: 4 h  
Test atmosphere: vapour  
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****Components:**

methyl methacrylate:  
Species: Rabbit  
Method: OPPTS 870.2500  
Result: Skin irritation

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

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

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octadecyl methacrylate:  
Result: Skin irritation

methacrylic acid:  
Species: Rabbit  
Method: OECD Test Guideline 404  
Result: Extremely corrosive and destructive to tissue.

hexadecyl methacrylate:  
Result: Skin irritation

2,6-di-tert-butyl-p-cresol:  
Species: Rabbit  
Assessment: No skin irritation  
Result: slight irritation

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

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

Silicon, amorphous:  
Species: Rabbit  
Result: No eye irritation  
Assessment: No eye irritation  
Method: OECD Test Guideline 405

octadecyl methacrylate:  
Result: Eye irritation

methacrylic acid:  
Species: Rabbit  
Result: Irreversible effects on the eye

hexadecyl methacrylate:  
Result: Eye irritation

2,6-di-tert-butyl-p-cresol:  
Species: Rabbit  
Assessment: No eye irritation

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

methyl methacrylate:  
Exposure routes: Skin  
Species: Mouse  
Assessment: May cause sensitisation by skin contact.  
Method: OECD Test Guideline 429  
Result: May cause sensitisation by skin contact.

titanium dioxide:

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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.

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

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

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

2,6-di-tert-butyl-p-cresol:  
 Exposure routes: Skin  
 Species: Humans  
 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:**

methyl methacrylate:  
 Genotoxicity in vitro : Test Type: Microbial mutagenesis assay (Ames test)  
 Test system: Salmonella typhimurium  
 Method: OECD Test Guideline 471  
 Result: negative

titanium dioxide:  
 Genotoxicity in vitro : Test Type: Ames test  
 Concentration: 100 - 200 ug/plate  
 Metabolic activation: with and without metabolic activation

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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

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

octadecyl methacrylate:  
Genotoxicity in vitro

: Concentration: .1 - 1200 µg/L  
Metabolic activation: with and without metabolic activation  
Method: OECD Test Guideline 476  
Result: negative

Concentration: 33 - 5000 ug/plate  
Metabolic activation: with and without metabolic activation  
Method: OECD Test Guideline 471  
Result: negative

Concentration: 14.5 - 2233 µg/L  
Metabolic activation: with and without metabolic activation  
Method: OECD Test Guideline 473  
Result: negative

methacrylic acid:  
Genotoxicity in vitro

: Concentration: 33 - 4000 ug/plate  
Metabolic activation: with and without metabolic activation  
Method: OECD Test Guideline 471  
Result: negative

hexadecyl methacrylate:  
Genotoxicity in vitro

: Concentration: .1 - 1200 µg/L  
Metabolic activation: with and without metabolic activation  
Method: OECD Test Guideline 476  
Result: negative

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Concentration: 33 - 5000 ug/plate  
 Metabolic activation: with and without metabolic activation  
 Method: OECD Test Guideline 471  
 Result: negative

Concentration: 14.5 - 2233 µg/L  
 Metabolic activation: with and without metabolic activation  
 Method: OECD Test Guideline 473  
 Result: negative

2,6-di-tert-butyl-p-cresol:  
 Genotoxicity in vitro

: Metabolic activation: with and without metabolic activation  
 Result: negative

Metabolic activation: Metabolic activation  
 Result: negative

Concentration: 100 - 1000 ug/plate  
 Metabolic activation: with and without metabolic activation  
 Result: negative

**Components:**

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/m<sup>3</sup>  
 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

Silicon, amorphous:  
 Genotoxicity in vivo

: Application Route: Inhalation  
 Dose: 50 mg/m<sup>3</sup>  
 Result: negative

octadecyl methacrylate:  
 Genotoxicity in vivo

: Application Route: Oral  
 Exposure time: 72 h  
 Dose: 5000 mg/kg  
 Method: OECD Test Guideline 474  
 Result: negative

methacrylic acid:  
 Genotoxicity in vivo

: Cell type: Somatic  
 Application Route: Inhalation  
 Exposure time: 2 h

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Dose: 100 - 1000 ppm  
Method: OECD Test Guideline 475  
Result: Not classified due to inconclusive data.

Application Route: Inhalation  
Exposure time: 6 h  
Dose: 100 - 9000 ppm  
Method: OECD Test Guideline 478  
Result: negative

hexadecyl methacrylate:  
Genotoxicity in vivo

: Application Route: Oral  
Exposure time: 72 h  
Dose: 5000 mg/kg  
Method: OECD Test Guideline 474  
Result: negative

2,6-di-tert-butyl-p-cresol:  
Genotoxicity in vivo

: Application Route: Intraperitoneal injection  
Dose: 75 mg/kg  
Result: negative

Application Route: Oral  
Exposure time: 9 Months  
Dose: ca 750 mg/kg  
Result: negative

**Components:**

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:**

methyl methacrylate:

Species: Rat, male and female

Application Route: Oral

Exposure time: 2 Years

Dose: 6, 60, 2000 ppm

Frequency of Treatment: once daily

NOAEL: 90.3 mg/kg bw/day

Result: negative

titanium dioxide:

Species: Rat, male and female

Application Route: Oral

Exposure time: 103 weeks

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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". IARCs 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.

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

methacrylic acid:

Species: Rat, male and female  
 Application Route: Inhalation  
 Exposure time: 24 month(s)  
 Dose: 250 - 1000 ppm  
 Frequency of Treatment: 5 daily  
 Method: OECD Test Guideline 453  
 Result: negative

Species: Rat, male and female  
 Application Route: Oral  
 Exposure time: 24 month(s)  
 Dose: 12 - 3300 ppm  
 Frequency of Treatment: 7 daily  
 Result: negative

2,6-di-tert-butyl-p-cresol:

Species: Rat, male and female  
 Application Route: Oral  
 Result: negative  
 Target Organs: Liver

**Components:**

titanium dioxide:

Carcinogenicity -  
 Assessment

**IARC**

: Not classifiable as a human carcinogen.

Group 2B: Possibly carcinogenic to humans  
 titanium dioxide

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**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** Known to be human carcinogen  
Talc (Mg<sub>3</sub>H<sub>2</sub>(SiO<sub>3</sub>)<sub>4</sub>)  
(Silica, Crystalline (Respirable Size))

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

octadecyl methacrylate:  
Effects on fertility

: Species: Rat, male and female  
Application Route: Oral  
Dose: >= 1000 milligram per kilogram  
Frequency of Treatment: 7 days/week  
Method: OECD Test Guideline 422  
Result: negative

Species: Rat, male and female  
Application Route: Oral  
Dose: 400 milligram per kilogram  
Frequency of Treatment: 7 days/week  
Method: OECD Test Guideline 416  
Result: negative

methacrylic acid:

Test Type: Two-generation study  
Species: Rat, male and female  
Application Route: Oral  
Dose: 0, 50, 150, 400 milligram per kilogram  
Fertility: No observed adverse effect level F1: 400 mg/kg body weight  
Symptoms: Reduced body weight  
Method: OPPTS 870.3800

hexadecyl methacrylate:

Species: Rat, male and female  
Application Route: Oral  
Dose: >=1000 milligram per kilogram  
Frequency of Treatment: 7 days/week  
Method: OECD Test Guideline 422  
Result: negative

Species: Rat, male and female  
Application Route: Oral  
Frequency of Treatment: 7 days/week  
Method: OECD Test Guideline 416  
Result: negative

2,6-di-tert-butyl-p-cresol:

Species: Rat, male and female

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Application Route: Oral  
Result: negative

**Components:**

methyl methacrylate:  
Effects on foetal  
development

: Species: Rat  
Application Route: Inhalation  
Dose: 99, 304, 1178 ppm  
Teratogenicity: No observed adverse effect concentration F1:  
8,300 mg/m<sup>3</sup>  
Embryo-foetal toxicity: No observed adverse effect  
concentration F1: 8,300 mg/m<sup>3</sup>  
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

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

octadecyl methacrylate:

Species: Rat, male and female  
Application Route: Oral  
General Toxicity Maternal: No observed adverse effect level:  
1,000 mg/kg body weight



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Method: OECD Test Guideline 422  
Result: No teratogenic effects

Species: Rat, female  
Application Route: Inhalation  
General Toxicity Maternal: No observed adverse effect level:  
100 ppm  
Method: OECD Test Guideline 414  
Result: No teratogenic effects

methacrylic acid:

Test Type: Pre-natal  
Species: Rat, male and female  
Application Route: Inhalation  
Dose: 200, 300 ppm  
Embryo-foetal toxicity: No observed adverse effect  
concentration F1: 300 ppm  
Method: OECD Test Guideline 414  
Result: No effects on fertility and early embryonic  
development were detected.

Test Type: Pre-natal  
Species: Rabbit, male and female  
Application Route: Oral  
Dose: 50, 150, 450 milligram per kilogram  
General Toxicity Maternal: No observed adverse effect level:  
50 mg/kg body weight  
Developmental Toxicity: No observed adverse effect level F1:  
450 mg/kg body weight  
Result: No effects on fertility and early embryonic  
development were detected.

hexadecyl methacrylate:

Species: Rat, male and female  
Application Route: Oral  
General Toxicity Maternal: No observed adverse effect level:  
1,000 mg/kg body weight  
Method: OECD Test Guideline 422  
Result: No teratogenic effects

Species: Rat, female  
Application Route: Inhalation  
General Toxicity Maternal: No observed adverse effect level:  
100 ppm  
Method: OECD Test Guideline 414  
Result: No teratogenic effects

2,6-di-tert-butyl-p-cresol:

Species: Rat  
Application Route: Oral  
General Toxicity Maternal: No observed adverse effect level:  
100 mg/kg body weight  
Result: No teratogenic effects

**Components:**

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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:**

methyl methacrylate:  
Exposure routes: Inhalation  
Target Organs: Respiratory Tract  
Assessment: May cause respiratory irritation.



octadecyl methacrylate:  
Exposure routes: Inhalation  
Target Organs: Respiratory Tract  
Assessment: May cause respiratory irritation.

methacrylic acid:  
Target Organs: Respiratory system  
Assessment: The substance or mixture is classified as specific target organ toxicant, single exposure, category 3 with respiratory tract irritation.

hexadecyl methacrylate:  
Exposure routes: Inhalation  
Target Organs: Respiratory Tract  
Assessment: May cause respiratory irritation.

**STOT - repeated exposure**

No data available

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

methyl methacrylate:  
Species: Rat, male and female  
NOAEL: 124.1 mg/kg  
Application Route: oral (drinking water)  
Exposure time: 2 years  
Number of exposures: daily  
Dose: 6, 60, 2000 ppm

titanium dioxide:  
Species: Rat, male and female  
: 3500 mg/m<sup>3</sup>  
Application Route: Ingestion  
Test atmosphere: dust/mist  
Exposure time: 2 yr  
Number of exposures: 5 d  
Method: Chronic toxicity

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Species: Rat, male and female  
: 10 - 50 mg/m<sup>3</sup>  
Application Route: Inhalation  
Exposure time: 2 yr  
Number of exposures: 6 hours/day, 5 days/week  
Method: Chronic 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  
: 4000 - 4500 mg/m<sup>3</sup>  
Application Route: Ingestion  
Test atmosphere: dust/mist  
Exposure time: 13 Weeks  
Number of exposures: 7 d  
Method: OECD Test Guideline 413

octadecyl methacrylate:  
Species: Rat, male and female  
NOAEL: 1000 mg/kg  
Application Route: Ingestion  
Number of exposures: 7 d  
Method: Subchronic toxicity

Species: Rat, male and female  
NOAEL: 120 mg/kg  
Application Route: Ingestion  
Exposure time: 2,160 h  
Number of exposures: 7 d  
Method: Subchronic toxicity

methacrylic acid:  
Species: Rat, male and female  
NOEC: 500 ppm  
Test atmosphere: vapour  
Exposure time: 2 yr  
Number of exposures: 5 d  
Method: OECD Test Guideline 453

hexadecyl methacrylate:  
Species: Rat, male and female  
NOAEL: 1000 mg/kg  
Application Route: Ingestion  
Number of exposures: 7 d  
Method: Subchronic toxicity

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Species: Rat, male and female  
NOAEL: 120 mg/kg  
Application Route: Ingestion  
Exposure time: 2,160 h  
Number of exposures: 7 d  
Method: Subchronic toxicity

2,6-di-tert-butyl-p-cresol:  
Species: Rat, male and female  
NOAEL: 25 mg/kg/d  
Application Route: Ingestion  
Method: Chronic toxicity

**Components:**

titanium dioxide:  
Repeated dose toxicity - Assessment : No skin irritation, No eye irritation  
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****Product:**

Remarks: Solvents may degrease the skin.

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**SECTION 12. ECOLOGICAL INFORMATION****Ecotoxicity****Components:**

methyl methacrylate:

Toxicity to fish : LC50: 191 mg/l  
Exposure time: 96 h

LC50 (Oncorhynchus mykiss (rainbow trout)): > 79 mg/l  
Exposure time: 96 h  
Test Type: flow-through test  
Method: Fish Early-life Stage Toxicity Test

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

Silicon, amorphous:

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

methacrylic acid:

Toxicity to fish : LC50 (Oncorhynchus mykiss (rainbow trout)): 85 mg/l  
Exposure time: 96 h  
Test Type: flow-through test  
Test substance: Fresh water  
Method: Fish Acute Toxicity Test  
Remarks: Toxic to aquatic organisms.

Talc (Mg<sub>3</sub>H<sub>2</sub>(SiO<sub>3</sub>)<sub>4</sub>):

Toxicity to fish : LC50 (Brachydanio rerio (zebrafish)): > 100 mg/l  
Exposure time: 24 h

**Components:**

methyl methacrylate:

Toxicity to daphnia and other aquatic invertebrates : EC50: 69 mg/l  
Exposure time: 48 h

Silicon, amorphous:

Toxicity to daphnia and other aquatic invertebrates : EL50 (Daphnia magna (Water flea)): >= 1,000 mg/l  
Exposure time: 24 h  
Test Type: static test  
Test substance: Fresh water  
Method: OECD Test Guideline 202

methacrylic acid:

Toxicity to daphnia and other : EC50 (Daphnia magna (Water flea)): > 130 mg/l

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aquatic invertebrates

Exposure time: 48 h  
 Test Type: flow-through test  
 Test substance: Fresh water  
 Method: Aquatic Invertebrate Acute Toxicity Test, Freshwater Daphnids

2,6-di-tert-butyl-p-cresol:  
 Toxicity to daphnia and other aquatic invertebrates

: EC50 (Daphnia magna (Water flea)): 0.61 mg/l  
 Exposure time: 48 h  
 Test Type: static test  
 Test substance: Fresh water  
 Method: OECD Test Guideline 202

**Components:**

methyl methacrylate:  
 Toxicity to algae/aquatic plants

: EC50: > 110 mg/l  
 Exposure time: 72 h

Silicon, amorphous:  
 Toxicity to algae/aquatic plants

: 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

methacrylic acid:  
 Toxicity to algae/aquatic plants

: ErC50 (Selenastrum capricornutum (green algae)): 45 mg/l  
 Exposure time: 72 h  
 Test Type: static test  
 Test substance: Fresh water  
 Method: OECD Test Guideline 201

2,6-di-tert-butyl-p-cresol:  
 Toxicity to algae/aquatic plants

: EC50 (Desmodesmus subspicatus (green algae)): > 0.4 mg/l  
 Exposure time: 72 h  
 Test Type: static test  
 Method: Directive 67/548/EEC, Annex V, C.3.

**Components:**

2,6-di-tert-butyl-p-cresol:  
 M-Factor (Acute aquatic toxicity)

: 1

**Components:**

methacrylic acid:  
 Toxicity to fish (Chronic toxicity)

: NOEC (Brachydanio rerio (zebrafish)): 10 mg/l  
 Exposure time: 35 d  
 Test Type: flow-through test  
 Test substance: Fresh water  
 Method: OECD Test Guideline 210

2,6-di-tert-butyl-p-cresol:  
 Toxicity to fish (Chronic toxicity)

: LC0 (Brachydanio rerio (zebrafish)): >= 0.57 mg/l  
 Exposure time: 96 hrs

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Test Type: semi-static test  
Method: Directive 67/548/EEC, Annex V, C.1.

**Components:**

methyl methacrylate:

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (Daphnia magna (Water flea)): 37 mg/l  
Exposure time: 21 d  
Test Type: flow-through test  
Method: OECD Test Guideline 211

methacrylic acid:

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (Daphnia magna (Water flea)): 53 mg/l  
Exposure time: 21 d  
Test Type: flow-through test  
Test substance: Fresh water  
Method: OECD Test Guideline 211

2,6-di-tert-butyl-p-cresol:

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (Daphnia magna (Water flea)): 0.32 mg/l  
Exposure time: 21 d  
Test Type: semi-static test  
Method: OECD Test Guideline 202

EC0 (Daphnia magna (Water flea)): >= 0.31 mg/l  
Exposure time: 48 hrs  
Test Type: static test  
Method: Directive 67/548/EEC, Annex V, C.2.

NOEC (Daphnia magna (Water flea)): 0.23 mg/l  
Exposure time: 48 hrs  
Test Type: static test  
Method: OECD Test Guideline 202

NOEC (Daphnia magna (Water flea)): 0.316 mg/l  
Exposure time: 21 d  
Test Type: semi-static test  
Method: OECD Test Guideline 202

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

**Components:**

methacrylic acid:

Toxicity to microorganisms : EC50 (Pseudomonas putida): 270 mg/l  
Exposure time: 17 h  
Test Type: static test  
Test substance: Fresh water  
Method: DIN 38 412 Part 8

2,6-di-tert-butyl-p-cresol:

Toxicity to microorganisms : IC50 (activated sludge): > 500 mg/l  
Exposure time: 0.5 h  
Method: Directive 67/548/EEC, Annex V, C.11

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: EC50 (activated sludge): > 10,000 mg/l  
 Exposure time: 3 h  
 Test Type: static test  
 Method: Directive 67/548/EEC, Annex, B.15

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

Chronic aquatic toxicity : No data available

Toxicity Data on Soil : No data available

Other organisms relevant to the environment : No data available

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



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methyl methacrylate:  
Biodegradability : Result: Readily biodegradable.  
Biodegradation: > 60 %  
Exposure time: 28 d

methacrylic acid:  
Biodegradability : Inoculum: activated sludge  
Concentration: 3 mg/l  
Result: Readily biodegradable.  
Biodegradation: 86 %  
Exposure time: 28 d  
Method: OECD Test Guideline 301D

2,6-di-tert-butyl-p-cresol:  
Biodegradability : Inoculum: activated sludge  
Result: Inherently biodegradable.  
Biodegradation: 5.2 %  
Exposure time: 112 d

Biochemical Oxygen Demand (BOD) : No data available

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

Stability in water : No data available

Photodegradation : No data available

Impact on Sewage Treatment : No data available

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

methyl methacrylate:  
Bioaccumulation : Bioconcentration factor (BCF): 3

titanium dioxide:  
Bioaccumulation : Species: Oncorhynchus mykiss (rainbow trout)  
Bioconcentration factor (BCF): 19 - 352  
Exposure time: 14 d  
Test substance: Fresh water

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Method: semi-static test  
Remarks: Does not bioaccumulate.

2,6-di-tert-butyl-p-cresol:  
Bioaccumulation : Species: Cyprinus carpio (Carp)  
Bioconcentration factor (BCF): 330 - 1,800  
Exposure time: 28 d  
Method: flow-through test

**Components:**

methyl methacrylate:  
Partition coefficient: n-  
octanol/water : log Pow: 1.38

methacrylic acid:  
Partition coefficient: n-  
octanol/water : log Pow: 0.93 (72 °F / 22 °C)  
pH: 2.2

2,6-di-tert-butyl-p-cresol:  
Partition coefficient: n-  
octanol/water : log Pow: 5.1

**Mobility in soil**

Mobility : No data available

**Components:**

2,6-di-tert-butyl-p-cresol:  
Distribution among  
environmental compartments : Koc: 8183  
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).

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Additional ecological information - Product : An environmental hazard cannot be excluded in the event of unprofessional handling or disposal. Harmful to aquatic life.

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 national regulations.  
Dispose of contents/ container to an approved waste disposal plant.

Contaminated packaging : Empty remaining contents.  
Dispose of as unused product.  
Do not re-use empty containers.  
Do not burn, or use a cutting torch on, the empty drum.

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

UN/ID No. : UN 1133  
Proper shipping name : Adhesives  
Class : 3  
Packing group : II  
Labels : Flammable Liquids  
Packing instruction (cargo aircraft) : 364  
Packing instruction (passenger aircraft) : 353

**IMDG**

UN number : UN 1133  
Proper shipping name : ADHESIVES  
Class : 3  
Packing group : II  
Labels : 3  
EmS Code : F-E, S-D  
Marine pollutant : no



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**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 1133
Proper shipping name	:	ADHESIVES
Class	:	3
Packing group	:	II
Labels	:	FLAMMABLE LIQUID
ERG Code	:	128
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****EPCRA - Emergency Planning and Community Right-to-Know Act****CERCLA Reportable Quantity**

Components	CAS-No.	Component RQ (lbs)	Calculated product RQ (lbs)
methyl methacrylate	80-62-6	1000	2085

**SARA 311/312 Hazards** : Flammable (gases, aerosols, liquids, or solids)  
 Skin corrosion or irritation  
 Serious eye damage or eye irritation  
 Respiratory or skin sensitisation  
 Specific target organ toxicity (single or repeated exposure)

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

methyl methacrylate	80-62-6	>= 30 - < 50 %
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The following chemical(s) are listed as HAP under the U.S. Clean Air Act, Section 12 (40 CFR 61):

methyl methacrylate	80-62-6
---------------------	---------

**California Prop. 65**

WARNING: This product can expose you to chemicals including arsenic, which is/are known to the State of California to cause cancer, and methanol, Ethylene glycol, 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](http://www.P65Warnings.ca.gov).

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

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CH INV	: The formulation contains substances listed on the Swiss 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	: On the inventory, or in compliance with the inventory
ENCS	: Not in compliance with the inventory
KECI	: On the inventory, or 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), KECI (Korea), NZIoC (New Zealand), PICCS (Philippines), TCSI (Taiwan), TSCA (USA)

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

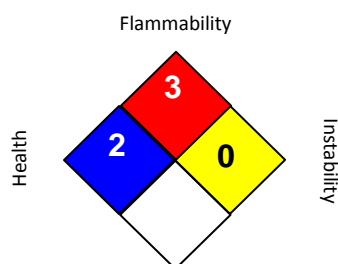
No substances are subject to a Significant New Use Rule.

**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.

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

<b>HEALTH</b>		<b>2</b>
<b>FLAMMABILITY</b>		<b>3</b>
<b>PHYSICAL HAZARD</b>		<b>0</b>

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

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ACGIH : USA. ACGIH Threshold Limit Values (TLV)

NIOSH REL : USA. NIOSH Recommended Exposure Limits

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

ACGIH / STEL : Short-term exposure limit

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

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.

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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Authorized Distributor

