

**ARALDITE® 2081-10 A**

Version 1.0      Revision Date: 04/06/2022      SDS Number: 400000012748      Date of last issue: -  
Date of first issue: 04/06/2022

Print Date 07/24/2023

**SECTION 1. IDENTIFICATION**

Product name : ARALDITE® 2081-10 A

**Manufacturer or supplier's details**

Company name of supplier : Huntsman Advanced Materials  
Address : Americas LLC : P.O. Box 4980  
The Woodlands,  
TX 77387  
United States of America (USA)

Telephone : Non-Emergency: (800) 257-5547

E-mail address of person responsible for the SDS : Global\_Product\_EHS\_AdMat@huntsman.com

Emergency telephone number : Chemtrec: (800) 424-9300 or (703) 527-3887

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

Recommended use : Resin



chemical-concepts.com  
**800.220.1966**  
410 Pike Road • Huntingdon Valley, PA 19006

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

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

**GHS label elements**

Hazard pictograms :



Signal word : Warning

Hazard statements : H315 Causes skin irritation.  
H317 May cause an allergic skin reaction.  
H319 Causes serious eye irritation.  
H335 May cause respiratory irritation.  
H401 Toxic to aquatic life.

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Precautionary statements : **Prevention:**  
 P261 Avoid breathing mist or vapours.  
 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:**  
 P302 + P352 IF ON SKIN: Wash with plenty of soap and water.  
 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.  
**Storage:**  
 P403 + P233 Store in a well-ventilated place. Keep container tightly closed.  
 P405 Store locked up.  
**Disposal:**  
 P501 Dispose of contents/container to an approved facility in accordance with local, regional, national and international regulations.

**Other hazards**

None known.

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

Substance / Mixture : Mixture

**Hazardous components**

Chemical name	CAS-No.	Concentration (% w/w)
benzyl methacrylate	2495-37-6	50 - 70
Ethoxylated bis-phenol A dimethacrylate	41637-38-1	5 - 10
methacrylic acid	79-41-4	1 - 3
titanium dioxide	13463-67-7	1 - 5
2,2'-[(4-methylphenyl)imino]bisethanol	3077-12-1	0.1 - 1
3,9-bis(2,4-di-tert-butylphenoxy)-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane	26741-53-7	0.1 - 1

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

128-37-0

0.1 - 1

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

**SECTION 4. FIRST AID MEASURES**

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

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**SECTION 5. FIREFIGHTING MEASURES**

- Suitable extinguishing media : Water spray  
Alcohol-resistant foam  
Carbon dioxide (CO<sub>2</sub>)  
Dry chemical
- Unsuitable extinguishing media : Exercise caution when using a high volume water jet as it may scatter and spread fire
- Specific hazards during firefighting : Do not allow run-off from fire fighting to enter drains or water courses.
- Hazardous combustion products : Carbon oxides  
Metal oxides  
Halogenated compounds
- Specific extinguishing methods : Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
- Further information : Collect contaminated fire extinguishing water separately. This must not be discharged into drains.  
Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.
- Special protective equipment for firefighters : Wear self-contained breathing apparatus for firefighting if necessary.

**SECTION 6. ACCIDENTAL RELEASE MEASURES**

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

**SECTION 7. HANDLING AND STORAGE**

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

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should avoid contact, including dermal contact, with this product.  
Do not breathe vapours/dust.  
Avoid exposure - obtain special instructions before use.  
Avoid contact with skin and eyes.  
For personal protection see section 8.  
Smoking, eating and drinking should be prohibited in the application area.  
To avoid spills during handling keep bottle on a metal tray.  
Dispose of rinse water in accordance with local and national regulations.

- Conditions for safe storage : Keep container tightly closed in a dry and well-ventilated place.  
Containers which are opened must be carefully resealed and kept upright to prevent leakage.  
Observe label precautions.  
Keep in properly labelled containers.
- Materials to avoid : For incompatible materials please refer to Section 10 of this SDS.
- 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
methacrylic acid	79-41-4	TWA	20 ppm	ACGIH
		TWA	20 ppm 70 mg/m <sup>3</sup>	NIOSH REL
		TWA	20 ppm 70 mg/m <sup>3</sup>	OSHA P0
titanium dioxide	13463-67-7	TWA (total dust)	15 mg/m <sup>3</sup>	OSHA Z-1
		TWA	10 mg/m <sup>3</sup> (Titanium dioxide)	ACGIH
		TWA (Total dust)	10 mg/m <sup>3</sup>	OSHA P0
2,6-di-tert-butyl-p-cresol	128-37-0	TWA (Inhalable fraction and vapor)	2 mg/m <sup>3</sup>	ACGIH
		TWA	10 mg/m <sup>3</sup>	NIOSH REL
		TWA	10 mg/m <sup>3</sup>	OSHA P0

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**Personal protective equipment**

Respiratory protection : General and local exhaust ventilation is recommended to maintain vapor exposures below recommended limits. Where concentrations are above recommended limits or are unknown, appropriate respiratory protection should be worn. Follow OSHA respirator regulations (29 CFR 1910.134) and use NIOSH/MSHA approved respirators. Protection provided by air purifying respirators against exposure to any hazardous chemical is limited. Use a positive pressure air supplied respirator if there is any potential for uncontrolled release, exposure levels are unknown, or any other circumstance where air purifying respirators may not provide adequate protection.

## Hand protection

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

Material : Nitrile rubber  
Break through time : 10 - 480 min

Material : Ethyl Vinyl Alcohol Laminate (EVAL)  
Break through time : > 8 h

Remarks : The selected protective gloves have to satisfy the specifications of Regulation (EU) 2016/425 and the standard EN 374 derived from it.  
Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough.  
Take note of the information given by the producer concerning permeability and break through times, and of special workplace conditions (mechanical strain, duration of contact).  
Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.  
The suitability for a specific workplace should be discussed with the producers of the protective gloves.

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

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

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

**SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES**

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Appearance	: paste
Colour	: off-white
Odour	: slight
Odour Threshold	: No data is available on the product itself.
pH	: substance/mixture is non-soluble (in water)
Melting point/freezing point	: No data is available on the product itself.
Boiling point	: No data is available on the product itself.
Flash point	: 239.9 °F / 115.5 °C Method: ISO 2719, closed cup
Evaporation rate	: No data is available on the product itself.
Flammability (solid, gas)	: No data is available on the product itself.
Flammability (liquids)	: No data is available on the product itself.
Upper explosion limit / Upper flammability limit	: No data is available on the product itself.
Lower explosion limit / Lower flammability limit	: No data is available on the product itself.
Vapour pressure	: No data is available on the product itself.
Relative vapour density	: No data is available on the product itself.
Relative density	: No data is available on the product itself.
Density	: ca. 1.04 g/cm <sup>3</sup> (77 °F / 25 °C) Method: estimated
Solubility(ies)	
Water solubility	: insoluble, immiscible Method: estimated
Solubility in other solvents	: No data is available on the product itself.
Partition coefficient: n-octanol/water	: No data is available on the product itself.
Auto-ignition temperature	: No data is available on the product itself.
Decomposition temperature	: No data is available on the product itself.
Self-Accelerating decomposition temperature (SADT)	: No data is available on the product itself.
Viscosity	

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Viscosity, dynamic	:	60,000 - 80,000 mPa.s (77 °F / 25 °C) Method: Measured
Explosive properties	:	No data is available on the product itself.
Oxidizing properties	:	No data is available on the product itself.
Particle size	:	No data is available on the product itself.

**SECTION 10. STABILITY AND REACTIVITY**

Reactivity	:	No dangerous reaction known under conditions of normal use.
Chemical stability	:	Stable under normal conditions.
Possibility of hazardous reactions	:	No hazards to be specially mentioned.
Conditions to avoid	:	None known.
Incompatible materials	:	None known.
Hazardous decomposition products	:	No decomposition if stored and applied as directed.
Hazardous decomposition products	:	carbon dioxide carbon monoxide Halogenated compounds

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

Acute oral toxicity	:	Acute toxicity estimate: 3,923 mg/kg Method: Calculation method
Acute inhalation toxicity	:	Acute toxicity estimate: > 200 mg/l Exposure time: 4 h Test atmosphere: vapour Method: Calculation method
Acute dermal toxicity	:	Acute toxicity estimate: 3,011 mg/kg Method: Calculation method

**Components:****benzyl methacrylate:**

Acute oral toxicity	:	LD50 (Rat): > 3,945 mg/kg
Acute dermal toxicity	:	LD50 (Rat): > 2,000 mg/kg

**methacrylic acid:**

Acute oral toxicity	:	LD50 (Rat, male): 1,320 mg/kg
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Method: OECD Test Guideline 401

GLP: no

Assessment: The component/mixture is moderately toxic after single ingestion.

- Acute inhalation toxicity : LC50 (Rat, male and female): 7.1 mg/l  
Exposure time: 4 h  
Test atmosphere: vapour  
Method: OECD Test Guideline 403  
GLP: yes  
Assessment: The component/mixture is moderately toxic after short term inhalation.
- Acute dermal toxicity : LD50 (Rabbit): 500 - 1,000 mg/kg  
GLP: no  
Assessment: The component/mixture is toxic after single contact with skin.

**titanium dioxide:**

- Acute oral toxicity : LD50 (Rat, female): > 5,000 mg/kg  
Method: OECD Test Guideline 425  
Assessment: The substance or mixture has no acute oral toxicity
- Acute inhalation toxicity : LC50 (Rat, male and female): 3.43 - 5.09 mg/l  
Exposure time: 4 h  
Test atmosphere: dust/mist  
Method: OECD Test Guideline 403  
Assessment: The substance or mixture has no acute inhalation toxicity
- Acute dermal toxicity : LD50 Dermal (Rabbit): > 10,000 mg/kg

**2,2'-[(4-methylphenyl)imino]bisethanol:**

- Acute oral toxicity : LD50 (Rat, male and female): 959 mg/kg  
Method: OECD Test Guideline 401  
GLP: no  
Assessment: The component/mixture is moderately toxic after single ingestion.
- Acute dermal toxicity : LD50 (Rat, male and female): > 2,000 mg/kg  
Method: OECD Test Guideline 402  
GLP: yes  
Assessment: The substance or mixture has no acute dermal toxicity

**3,9-bis(2,4-di-tert-butylphenoxy)-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane:**

- Acute oral toxicity : LD50 (Rat): > 5,000 mg/kg  
Method: OECD Test Guideline 401
- Acute inhalation toxicity : LC50 (Rat, male and female): > 2 mg/l  
Exposure time: 1 h  
Test atmosphere: dust/mist  
Method: OECD Test Guideline 403

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Assessment: The substance or mixture has no acute inhalation toxicity

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

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

Acute oral toxicity : LD50 (Rat, male and female): > 6,000 mg/kg  
Method: OECD Test Guideline 401  
Assessment: The substance or mixture has no acute oral toxicity

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

**Skin corrosion/irritation****Components:****benzyl methacrylate:**

Assessment : Irritating to skin.  
Result : Skin irritation

**methacrylic acid:**

Species : Rabbit  
Assessment : Causes severe burns.  
Method : OECD Test Guideline 404  
Result : Extremely corrosive and destructive to tissue.  
GLP : yes

**titanium dioxide:**

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

**2,2'-[(4-methylphenyl)imino]bisethanol:**

Species : Rabbit  
Assessment : No skin irritation  
Method : Other guidelines  
Result : No skin irritation  
GLP : no

**3,9-bis(2,4-di-tert-butylphenoxy)-2,4,8,10-tetraoxa-3,9-diphoshaspiro[5.5]undecane:**

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

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

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

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

Result : Eye irritation  
Assessment : Irritating to eyes.

**methacrylic acid:**

Species : Rabbit  
Result : Irreversible effects on the eye  
Assessment : Risk of serious damage to eyes.  
Method : Draize Test  
GLP : no

**titanium dioxide:**

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

**2,2'-[(4-methylphenyl)imino]bisethanol:**

Species : Rabbit  
Result : Risk of serious damage to eyes.  
Assessment : Risk of serious damage to eyes.  
Method : OECD Test Guideline 405  
GLP : no

**3,9-bis(2,4-di-tert-butylphenoxy)-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane:**

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

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

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

**Respiratory or skin sensitisation****Components:****benzyl methacrylate:**

Assessment : Probability or evidence of low to moderate skin sensitisation

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Result : rate in humans  
: Probability or evidence of low to moderate skin sensitisation  
rate in humans

**methacrylic acid:**

Test Type : Buehler Test  
Exposure routes : Skin  
Species : Guinea pig  
Assessment : Did not cause sensitisation on laboratory animals.  
Method : OECD Test Guideline 406  
Result : Did not cause sensitisation on laboratory animals.

**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.

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

**2,2'-[(4-methylphenyl)imino]bisethanol:**

Test Type : Local lymph node assay (LLNA)  
Species : Mouse  
Assessment : May cause sensitisation by skin contact.  
Method : OECD Test Guideline 429  
Result : May cause sensitisation by skin contact.  
GLP : yes  
Remarks : Information given is based on data obtained from similar substances.

**3,9-bis(2,4-di-tert-butylphenoxy)-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane:**

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

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

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

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**Germ cell mutagenicity****Components:****benzyl methacrylate:**

Genotoxicity in vitro : Test Type: reverse mutation assay  
Metabolic activation: with and without metabolic activation  
Result: negative

Test Type: Micronucleus test  
Metabolic activation: with and without metabolic activation  
Result: negative

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

**methacrylic acid:**

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

Genotoxicity in vivo : Test Type: in vivo assay  
Species: Rat (male)  
Cell type: Somatic  
Application Route: Inhalation  
Exposure time: 2 h  
Dose: 0.4, 1.6, 2.8 and 4 mg/L  
Method: OECD Test Guideline 475  
Result: Not classified due to inconclusive data.  
GLP: no

Test Type: dominant lethal test  
Species: Mouse (male)  
Application Route: Inhalation  
Exposure time: 6 h  
Dose: 0.405, 4.05 and 36.45 mg/L  
Method: OECD Test Guideline 478  
Result: negative  
GLP: no

**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

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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

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

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

**2,2'-[(4-methylphenyl)imino]bisethanol:**

Genotoxicity in vitro : Test Type: reverse mutation assay  
Test system: Salmonella typhimurium  
Metabolic activation: with and without metabolic activation  
Method: OECD Test Guideline 471  
Result: negative  
GLP: no

Test Type: Chromosome aberration test in vitro  
Test system: Human lymphocytes  
Metabolic activation: with and without metabolic activation  
Method: OECD Test Guideline 473  
Result: negative  
GLP: yes  
Remarks: Information given is based on data obtained from similar substances.

Test Type: In vitro mammalian cell gene mutation test  
Test system: mouse lymphoma cells  
Metabolic activation: with and without metabolic activation  
Method: OECD Test Guideline 476  
Result: negative  
GLP: yes  
Remarks: Information given is based on data obtained from similar substances.

**3,9-bis(2,4-di-tert-butylphenoxy)-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane:**

Genotoxicity in vitro : Method: OECD Test Guideline 471

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Result: negative

Method: OECD Test Guideline 476

Result: negative

Method: OECD Test Guideline 473

Result: negative

Genotoxicity in vivo : Application Route: Intraperitoneal injection  
 Exposure time: 48 h  
 Dose: 2000 mg/kg  
 Method: OECD Test Guideline 474  
 Result: negative

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

Genotoxicity in vitro : Test Type: reverse mutation assay  
 Metabolic activation: with and without metabolic activation  
 Result: negative

Test Type: Chromosome aberration test in vitro  
 Metabolic activation: with and without metabolic activation  
 Result: negative

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

**Carcinogenicity****Components:****methacrylic acid:**

Species : Rat, male and female  
 Application Route : inhalation (vapour)  
 Exposure time : 102 weeks  
 Frequency of Treatment : 5 days/week  
 NOAEL :  $\geq 2.05$  mg/kg body weight  
 Method : OECD Test Guideline 451

Species : Mouse, male and female  
 Application Route : inhalation (vapour)  
 Exposure time : 102 weeks  
 Dose : ca. 2.05 and 4.1 mg/L  
 Frequency of Treatment : 5 days/week  
 LOAEL : ca. 2.05 mg/l  
 Method : OECD Test Guideline 451

**titanium dioxide:**

Species : Rat, male and female  
 Application Route : Oral

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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". 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.

Carcinogenicity - Assessment : Not classifiable as a human carcinogen.

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

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

**IARC** Group 2B: Possibly carcinogenic to humans  
 titanium dioxide 13463-67-7

**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:****benzyl methacrylate:**

Effects on fertility : Test Type: Combined Repeated Dose Toxicity Study with the Reproduction / Developmental Toxicity Screening Test  
 Species: Rat  
 Application Route: Oral  
 General Toxicity - Parent: NOAEL: 500

**methacrylic acid:**

Effects on fertility : Test Type: Two-generation study  
 Species: Rat, male and female



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Application Route: Oral  
 Dose: 0, 50, 150, 450 mg/kg/day  
 General Toxicity - Parent: NOAEL: 50 mg/kg body weight  
 Fertility: NOAEL F1: 400 mg/kg body weight  
 Symptoms: Reduced body weight  
 Method: OECD Test Guideline 416  
 GLP: yes

Effects on foetal development

: Test Type: Pre-natal  
 Species: Rat, female  
 Application Route: Inhalation  
 Dose: 0, 50, 100, 200 or 300 ppm  
 Duration of Single Treatment: 14 d  
 Frequency of Treatment: 7 days/week  
 General Toxicity Maternal: NOAEL: 200 ppm  
 Developmental Toxicity: NOAEL: >= 300 ppm  
 Embryo-foetal toxicity: NOAEC 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  
 Duration of Single Treatment: 23 d  
 Frequency of Treatment: 7 days/week  
 General Toxicity Maternal: NOAEL: 50 mg/kg body weight  
 Developmental Toxicity: NOAEL F1: 450 mg/kg body weight  
 Result: No effects on fertility and early embryonic development were detected.

**titanium dioxide:**

Effects on foetal development

: 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: NOAEL: 1,000 mg/kg body weight  
 Developmental Toxicity: NOAEL: 1,000 mg/kg body weight  
 Method: OECD Test Guideline 414  
 Result: No adverse effects

Reproductive toxicity - Assessment

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

**2,2'-[(4-methylphenyl)imino]bisethanol:**

Effects on foetal development

: Test Type: Pre-natal  
 Species: Rat, females  
 Application Route: Oral  
 Dose: 60/200/600 milligram per kilogram  
 Duration of Single Treatment: 15 d  
 General Toxicity Maternal: NOAEL: 200 mg/kg body weight  
 Developmental Toxicity: NOAEL: >= 600 mg/kg body weight  
 Method: OECD Test Guideline 414

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GLP: yes

Remarks: Information given is based on data obtained from similar substances.

**3,9-bis(2,4-di-tert-butylphenoxy)-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane:**

Effects on fertility : Species: Rat, male and female  
Application Route: Oral  
Method: OECD Test Guideline 415  
Result: negative

Effects on foetal development : Species: Rabbit  
Application Route: Oral  
General Toxicity Maternal: NOAEL: 200 mg/kg body weight  
Method: OECD Test Guideline 414  
Result: No teratogenic effects

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

Effects on fertility : Test Type: Two-generation study  
Species: Rat, male and female  
Application Route: Oral  
Dose: 25/100/500 mg/kg bw/day  
General Toxicity - Parent: NOAEL: 100 mg/kg body weight  
General Toxicity F1: NOAEL: 25 mg/kg body weight  
Result: negative

Effects on foetal development : Test Type: Pre-natal  
Species: Mouse, female  
Application Route: Oral  
Duration of Single Treatment: 7 d  
General Toxicity Maternal: NOAEL: 240 mg/kg body weight  
Developmental Toxicity: NOAEL: 800 mg/kg body weight  
Target Organs: spleen, Kidney

**STOT - single exposure****Components:****benzyl methacrylate:**

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

**methacrylic acid:**

Exposure routes : Inhalation  
Target Organs : Respiratory Tract  
Assessment : The substance or mixture is classified as specific target organ toxicant, single exposure, category 3 with respiratory tract irritation.

**STOT - repeated exposure**

No data available

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**Repeated dose toxicity****Components:****benzyl methacrylate:**

NOAEL : 500 mg/kg  
Application Route : Oral

**methacrylic acid:**

Species : Rat, male and female  
NOEC : 352 - 1232 mg/m<sup>3</sup>  
Application Route : inhalation (vapour)  
Test atmosphere : vapour  
Exposure time : 90 d  
Number of exposures : 6 h  
Dose : 70/352/1232 mg/m<sup>3</sup>  
Subsequent observation period : 5 days/week  
Method : OECD Test Guideline 413  
GLP : yes

**titanium dioxide:**

Species : Rat, male and female  
NOEC : 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

Species : Rat, male and female  
NOEC : 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

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

**2,2'-(4-methylphenyl)imino]bisethanol:**

Species : Rat, male and female  
NOAEL : 100 mg/kg  
Application Route : Oral  
Exposure time : 28 d  
Number of exposures : daily  
Dose : 100/300/600/1000 mg/kg bw/day  
Method : OECD Test Guideline 407  
GLP : yes  
Remarks : Information given is based on data obtained from similar substances.

**3,9-bis(2,4-di-tert-butylphenoxy)-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane:**

Species : Rat, male and female

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NOAEL	:	55 - 71 mg/kg/d
Application Route	:	Ingestion
Exposure time	:	2,160 h
Number of exposures	:	7 d
Method	:	Subchronic toxicity

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

Species	:	Pig, male and female
NOAEL	:	>= 61 mg/kg
Application Route	:	oral (feed)
Exposure time	:	daily
Method	:	Chronic toxicity

**Aspiration toxicity**

No data available

**Experience with human exposure**

No data available

**Toxicology, Metabolism, Distribution**

No data available

**Neurological effects**

No data available

**Further information**

No data available

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

Toxicity to fish	:	LC50 (Fish): 4.67 mg/l End point: mortality Exposure time: 96 h
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Toxicity to algae/aquatic plants	:	EC50 (algae): 2.28 mg/l Exposure time: 96 h
----------------------------------	---	--

	:	EC10 (algae): 1.08 mg/l Exposure time: 96 h
--	---	--

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	EC10: 3.34 mg/l Exposure time: 21 d
--	---	--

**Ecotoxicology Assessment**

Chronic aquatic toxicity	:	This product has no known ecotoxicological effects.
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**methacrylic acid:**

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

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): > 130 mg/l  
 End point: Immobilization  
 Exposure time: 48 h  
 Test Type: flow-through test  
 Analytical monitoring: yes  
 Test substance: Fresh water  
 Method: Aquatic Invertebrate Acute Toxicity Test, Freshwater Daphnids  
 GLP: yes

Toxicity to algae/aquatic plants : ErC50 (Selenastrum capricornutum (green algae)): 45 mg/l  
 Exposure time: 72 h  
 Test Type: static test  
 Analytical monitoring: yes  
 Test substance: Fresh water  
 Method: OECD Test Guideline 201  
 GLP: yes

NOEC (Selenastrum capricornutum (green algae)): 8.2 mg/l  
 Exposure time: 72 h  
 Test Type: static test  
 Analytical monitoring: yes  
 Test substance: Fresh water  
 Method: OECD Test Guideline 201  
 GLP: yes

Toxicity to fish (Chronic toxicity) : NOEC (Brachydanio rerio (zebrafish)): 10 mg/l  
 Exposure time: 35 d  
 Test Type: flow-through test  
 Analytical monitoring: yes  
 Test substance: Fresh water  
 Method: OECD Test Guideline 210  
 GLP: yes

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  
 Analytical monitoring: yes  
 Test substance: Fresh water  
 Method: OECD Test Guideline 211  
 GLP: yes

Toxicity to microorganisms : EC50 (Pseudomonas putida): 270 mg/l  
 Exposure time: 16.5 h  
 Test Type: static test  
 Analytical monitoring: no  
 Test substance: Fresh water  
 Method: DIN 38 412 Part 8

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GLP: yes

**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

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

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

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

**2,2'-(4-methylphenyl)imino]bisethanol:**

Toxicity to fish : LC50 (Cyprinus carpio (Carp)): > 100 mg/l  
 End point: mortality  
 Exposure time: 96 h  
 Test Type: static test  
 Analytical monitoring: yes  
 Test substance: Fresh water  
 Method: OECD Test Guideline 203  
 GLP: yes  
 Remarks: Based on data from similar materials

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

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Remarks: Information given is based on data obtained from similar substances.

Toxicity to algae/aquatic plants : EC50 (Pseudokirchneriella subcapitata (green algae)): > 100 mg/l  
 Exposure time: 72 h  
 Test Type: static test  
 Analytical monitoring: yes  
 Test substance: Fresh water  
 Method: OECD Test Guideline 201  
 GLP: yes  
 Remarks: Based on data from similar materials

NOEC (Pseudokirchneriella subcapitata (green algae)): > 100 mg/l  
 Exposure time: 72 h  
 Test Type: static test  
 Analytical monitoring: yes  
 Test substance: Fresh water  
 Method: OECD Test Guideline 201  
 GLP: yes  
 Remarks: Based on data from similar materials

Toxicity to microorganisms : EC50 (activated sludge): > 1,000 mg/l  
 Exposure time: 3 h  
 Test Type: static test  
 Analytical monitoring: no  
 Test substance: Fresh water  
 Method: OECD Test Guideline 209  
 GLP: yes  
 Remarks: Information given is based on data obtained from similar substances.

**3,9-bis(2,4-di-tert-butylphenoxy)-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane:**

Toxicity to fish : LC50 (Brachydanio rerio (zebrafish)): 70.7 mg/l  
 Exposure time: 96 h  
 Test Type: static test  
 Test substance: Fresh water  
 Method: OECD Test Guideline 203

Toxicity to algae/aquatic plants : EC50 (Desmodesmus subspicatus (green algae)): 97 mg/l  
 Exposure time: 72 h  
 Test substance: Marine water  
 Method: OECD Test Guideline 201

M-Factor (Acute aquatic toxicity) : 1

Toxicity to fish (Chronic toxicity) : NOEC (Brachydanio rerio (zebrafish)): 50 mg/l  
 Exposure time: 96 hrs  
 Test Type: static test  
 Test substance: Fresh water  
 Method: OECD Test Guideline 203

Toxicity to daphnia and other aquatic invertebrates : NOEC (Daphnia magna (Water flea)): 0.1 mg/l  
 Exposure time: 21 d

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(Chronic toxicity)                      Test Type: semi-static test  
 Test substance: Fresh water  
 Method: OECD Test Guideline 211

M-Factor (Chronic aquatic toxicity)                      : 1

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

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

Toxicity to fish                      : LC50 (Fish): 0.199 mg/l  
 Exposure time: 96 h  
 Test substance: Fresh water  
 Method: QSAR

Toxicity to daphnia and other aquatic invertebrates                      : EC50 (Daphnia magna (Water flea)): 0.48 mg/l  
 End point: Immobilization  
 Exposure time: 48 h  
 Test Type: static test  
 Test substance: Fresh water  
 Method: OECD Test Guideline 202

Toxicity to algae/aquatic plants                      : EC50 (Pseudokirchneriella subcapitata (green algae)): > 0.24 mg/l  
 Exposure time: 72 h  
 Test Type: static test  
 Test substance: Fresh water  
 Method: OECD Test Guideline 201

NOEC (Pseudokirchneriella subcapitata (green algae)): 0.24 mg/l  
 Exposure time: 72 h  
 Test Type: static test  
 Test substance: Fresh water  
 Method: OECD Test Guideline 201

M-Factor (Acute aquatic toxicity)                      : 1

Toxicity to fish (Chronic toxicity)                      : NOEC (Oryzias latipes (Orange-red killifish)): 0.053 mg/l  
 Exposure time: 30 d  
 Test substance: Fresh water  
 Method: OECD Test Guideline 210

NOEC (Fish): >= 23.8 mg/l  
 Exposure time: 70 d  
 Test substance: Fresh water

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)                      : EC50 (Daphnia magna (Water flea)): 0.096 mg/l  
 Exposure time: 21 d  
 Test substance: Fresh water  
 Method: OECD Test Guideline 211



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NOEC (Daphnia magna (Water flea)): 0.069 mg/l  
 Exposure time: 21 d  
 Test substance: Fresh water  
 Method: OECD Test Guideline 211

M-Factor (Chronic aquatic toxicity) : 1

Toxicity to microorganisms : ErC50 (activated sludge): 1.7 mg/l  
 Exposure time: 24 h  
 Test Type: static test

**Persistence and degradability****Components:****benzyl methacrylate:**

Biodegradability : Result: Readily biodegradable.

**methacrylic acid:**

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

**2,2'-[(4-methylphenyl)imino]bisethanol:**

Biodegradability : aerobic  
 Inoculum: activated sludge, non-adapted  
 Concentration: 18 mg/l  
 Result: Not biodegradable  
 Biodegradation: 1.5 %  
 Exposure time: 28 d  
 Method: OECD Test Guideline 301B  
 GLP: yes  
 Remarks: Based on data from similar materials

**3,9-bis(2,4-di-tert-butylphenoxy)-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane:**

Biodegradability : Inoculum: activated sludge  
 Concentration: 31 mg/l  
 Result: Not readily biodegradable.  
 Biodegradation: < 10 %  
 Exposure time: 28 d

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

Biodegradability : Result: Not biodegradable

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**Bioaccumulative potential****Components:****benzyl methacrylate:**

Partition coefficient: n-octanol/water : log Pow: 3.1

**methacrylic acid:**Partition coefficient: n-octanol/water : log Pow: 0.93 (72 °F / 22 °C)  
pH: 2.2**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.**2,2'-[(4-methylphenyl)imino]bisethanol:**Partition coefficient: n-octanol/water : log Pow: 2 (95 °F / 35 °C)  
pH: 7  
Method: OECD Test Guideline 117**3,9-bis(2,4-di-tert-butylphenoxy)-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane:**

Bioaccumulation : Bioconcentration factor (BCF): 164

Partition coefficient: n-octanol/water : log Pow: 10.9 (77 °F / 25 °C)

**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

Partition coefficient: n-octanol/water : log Pow: 5.2

**Mobility in soil****Components:****2,6-di-tert-butyl-p-cresol:**

Distribution among environmental compartments : Koc: 8183

**Other adverse effects****Product:**Ozone-Depletion Potential : Regulation: 40 CFR Protection of Environment; Part 82  
Protection of Stratospheric Ozone - CAA Section 602 Class I

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**Substances**

Remarks: This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).

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

**SECTION 13. DISPOSAL CONSIDERATIONS****Disposal methods**

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

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

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

Not regulated as dangerous goods

**IATA-DGR**

Not regulated as dangerous goods

**IMDG-Code**

Not regulated as dangerous goods

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

Not applicable for product as supplied.

**National Regulations****49 CFR**

Not regulated as dangerous goods

**Special precautions for user**

Remarks : Not classified as dangerous in the meaning of transport regulations.

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

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

**SARA 311/312 Hazards** : No SARA Hazards

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**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 titanium dioxide, which is/are known to the State of California to cause cancer, and toluene, methanol, 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:**

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

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

NZIoC : Not 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 : All substances listed as active on the TSCA inventory

**Inventories**

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

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

No substances are subject to a Significant New Use Rule.

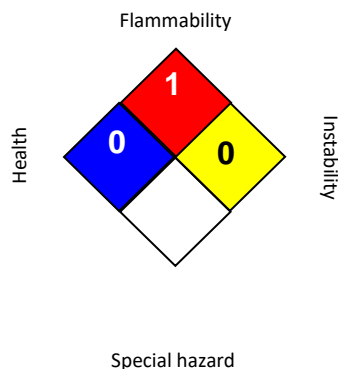
**US. Toxic Substances Control Act (TSCA) Section 12(b) Export Notification (40 CFR 707, Subpt D)**

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

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

<b>HEALTH</b>		<b>1</b>
<b>FLAMMABILITY</b>		<b>1</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 P0 : USA. Table Z-1-A Limits for Air Contaminants (1989 vacated values)  
 OSHA Z-1 : USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants  
 ACGIH / TWA : 8-hour, time-weighted average  
 NIOSH REL / TWA : Time-weighted average concentration for up to a 10-hour workday during a 40-hour workweek  
 OSHA P0 / TWA : 8-hour time weighted average  
 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.

**ARALDITE® 2081-10 A**

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**HARDENER 2081 B**

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**SECTION 1. IDENTIFICATION**

Product name : HARDENER 2081 B

**Manufacturer or supplier's details**

Company name of supplier : Huntsman Advanced Materials  
Address : Americas LLC : P.O. Box 4980  
The Woodlands,  
TX 77387  
United States of America (USA)

Telephone : Non-Emergency: (800) 257-5547

E-mail address : Global\_Product\_EHS\_AdMat@huntsman.com

Emergency telephone number : Chemtrec: (800) 424-9300 or (703) 527-3887

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

Recommended use : Hardener



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

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

**GHS label elements**

Hazard pictograms :



Signal word : Warning

Hazard statements : H315 Causes skin irritation.  
H317 May cause an allergic skin reaction.  
H319 Causes serious eye irritation.  
H410 Very toxic to aquatic life with long lasting effects.

Precautionary statements : **Prevention:**

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P261 Avoid breathing dust.  
 P264 Wash skin thoroughly after handling.  
 P272 Contaminated work clothing must not be allowed out of the workplace.  
 P273 Avoid release to the environment.  
 P280 Wear protective gloves/ 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.  
 P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention.  
 P337 + P313 If eye irritation persists: Get medical advice/ attention.  
 P362 Take off contaminated clothing and wash before reuse.  
 P391 Collect spillage.  
**Storage:**  
 Not available  
**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)
aluminium hydroxide	21645-51-2	20 - 30
dibenzoyl peroxide	94-36-0	10 - 20
2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane	1675-54-3	10 - 20
silicon dioxide	7631-86-9	1 - 5
carbon black	1333-86-4	0.1 - 1

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

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



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**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.
- Protection of first-aiders : First Aid responders should pay attention to self-protection and use the recommended protective clothing  
If potential for exposure exists refer to Section 8 for specific personal protective equipment.  
Avoid inhalation, ingestion and contact with skin and eyes.  
No action shall be taken involving any personal risk or without suitable training.  
It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.
- Notes to physician : Treat symptomatically.

**SECTION 5. FIREFIGHTING MEASURES**

- Suitable extinguishing media : Water spray  
Alcohol-resistant foam  
Carbon dioxide (CO<sub>2</sub>)  
Dry chemical
- Unsuitable extinguishing media : Exercise caution when using a high volume water jet as it may scatter and spread fire
- Specific hazards during firefighting : Do not allow run-off from fire fighting to enter drains or water courses.

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- Hazardous combustion products : Metal oxides  
Carbon oxides  
Halogenated compounds
- Specific extinguishing methods : Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
- Further information : Collect contaminated fire extinguishing water separately. This must not be discharged into drains.  
Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.
- Special protective equipment for firefighters : Wear self-contained breathing apparatus for firefighting if necessary.

**SECTION 6. ACCIDENTAL RELEASE MEASURES**

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

**SECTION 7. HANDLING AND STORAGE**

- Advice on protection against fire and explosion : Avoid dust formation.  
Provide appropriate exhaust ventilation at places where dust is formed.
- Advice on safe handling : Repeated or prolonged skin contact may cause skin irritation and/or dermatitis and sensitisation of susceptible persons.  
Persons suffering from asthma, eczema or skin problems should avoid contact, including dermal contact, with this product.  
Avoid formation of respirable particles.  
Do not breathe vapours/dust.  
Avoid exposure - obtain special instructions before use.  
Avoid contact with skin and eyes.  
For personal protection see section 8.  
Smoking, eating and drinking should be prohibited in the application area.  
Dispose of rinse water in accordance with local and national regulations.
- Conditions for safe storage : Keep container tightly closed in a dry and well-ventilated

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place.

Containers which are opened must be carefully resealed and kept upright to prevent leakage.

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
aluminium hydroxide	21645-51-2	TWA (Respirable particulate matter)	1 mg/m <sup>3</sup> (Aluminium)	ACGIH
dibenzoyl peroxide	94-36-0	TWA	5 mg/m <sup>3</sup>	ACGIH
		TWA	5 mg/m <sup>3</sup>	OSHA Z-1
		TWA	5 mg/m <sup>3</sup>	NIOSH REL
		TWA	5 mg/m <sup>3</sup>	OSHA P0
silicon dioxide	7631-86-9	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 (Respirable dust)	0.05 mg/m <sup>3</sup> (Silica)	NIOSH REL
		TWA	6 mg/m <sup>3</sup> (Silica)	NIOSH REL
		PEL (respirable)	0.05 mg/m <sup>3</sup>	OSHA CARC
carbon black	1333-86-4	TWA (Inhalable particulate matter)	3 mg/m <sup>3</sup>	ACGIH
		TWA	3.5 mg/m <sup>3</sup>	OSHA Z-1
		TWA	3.5 mg/m <sup>3</sup>	NIOSH REL
		TWA	3.5 mg/m <sup>3</sup>	OSHA P0
		TWA	0.1 mg/m <sup>3</sup> (PAHs)	NIOSH REL

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**Personal protective equipment**

- Respiratory protection : General and local exhaust ventilation is recommended to maintain vapor exposures below recommended limits. Where concentrations are above recommended limits or are unknown, appropriate respiratory protection should be worn. Follow OSHA respirator regulations (29 CFR 1910.134) and use NIOSH/MSHA approved respirators. Protection provided by air purifying respirators against exposure to any hazardous chemical is limited. Use a positive pressure air supplied respirator if there is any potential for uncontrolled release, exposure levels are unknown, or any other circumstance where air purifying respirators may not provide adequate protection.
- Hand protection
- Remarks : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.  
The suitability for a specific workplace should be discussed with the producers of the protective gloves.
- Eye protection : Eye wash bottle with pure water  
Tightly fitting safety goggles  
Wear face-shield and protective suit for abnormal processing problems.
- Skin and body protection : Choose body protection according to the amount and concentration of the dangerous substance at the work place.
- Hygiene measures : When using do not eat or drink.  
When using do not smoke.  
Wash hands before breaks and at the end of workday.

**SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES**

- Appearance : paste
- Colour : grey
- Odour : slight
- Odour Threshold : No data is available on the product itself.
- pH : substance/mixture is non-soluble (in water)
- Melting point/freezing point : No data is available on the product itself.
- Boiling point : No data is available on the product itself.
- Flash point : No data is available on the product itself.
- Evaporation rate : No data is available on the product itself.

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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	:	1.37 - 1.38 g/cm <sup>3</sup> (77 °F / 25 °C)
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.
Decomposition temperature	:	Decomposition energy (mass): 284 KJ/kg
Self-Accelerating decomposition temperature (SADT)	:	122 °F / 50 °C
Viscosity		
Viscosity, dynamic	:	60,000 - 80,000 mPa.s (77 °F / 25 °C)
Explosive properties	:	No data is available on the product itself.
Oxidizing properties	:	No data is available on the product itself.
Available oxygen content	:	> 0.9 - < 1 %
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	:	Dust may form explosive mixture in air.
Conditions to avoid	:	None known.

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Incompatible materials : None known.

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

Hazardous decomposition products : aluminium oxide  
carbon dioxide  
carbon monoxide  
Halogenated compounds

**SECTION 11. TOXICOLOGICAL INFORMATION****Acute toxicity****Components:****aluminium hydroxide:**

Acute oral toxicity : LD50 (Rat, female): > 2,000 mg/kg  
Method: OECD Test Guideline 423  
Assessment: The substance or mixture has no acute oral toxicity

**dibenzoyl peroxide:**

Acute oral toxicity : LD50 (Mouse, male and female): > 2,000 mg/kg  
Method: OECD Test Guideline 401  
Assessment: The substance or mixture has no acute oral toxicity

Acute inhalation toxicity : LC50 (Rat, male): > 24.3 mg/l  
Exposure time: 4 h  
Test atmosphere: dust/mist  
Method: OECD Test Guideline 403  
Assessment: The substance or mixture has no acute inhalation toxicity

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

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

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

**silicon dioxide:**

Acute oral toxicity : LD50 (Rat): > 5,000 mg/kg  
Method: OECD Test Guideline 401

Acute inhalation toxicity : LC50 (Rat, male and female): > 58.8 mg/l  
Exposure time: 4 h

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Test atmosphere: dust/mist  
Method: OECD Test Guideline 403

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

**carbon black:**

Acute oral toxicity : LD50 (Rat, male and female): > 8,000 mg/kg  
Method: OECD Test Guideline 401  
Assessment: The substance or mixture has no acute oral toxicity

Acute inhalation toxicity : LC50 (Rat): > 4.6 mg/m<sup>3</sup>  
Exposure time: 4 h  
Test atmosphere: dust/mist

**Skin corrosion/irritation****Components:****dibenzoyl peroxide:**

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

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

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

**silicon dioxide:**

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

**carbon black:**

Species : Rabbit  
Exposure time : 4 h  
Assessment : No skin irritation  
Method : OECD Test Guideline 404  
Result : No skin irritation

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

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

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

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

**silicon dioxide:**

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

**carbon black:**

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

**Respiratory or skin sensitisation****Components:****dibenzoyl peroxide:**

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

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

Test Type : Local lymph node assay (LLNA)  
Exposure routes : Skin  
Species : Mouse  
Method : OECD Test Guideline 429  
Result : The product is a skin sensitizer, sub-category 1B.

**carbon black:**

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

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

**Germ cell mutagenicity****Components:****dibenzoyl peroxide:**



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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

Genotoxicity in vivo : Cell type: Somatic  
Application Route: Intraperitoneal injection  
Dose: 0, 50, 100, 200 mg/kg b.w.  
Method: OECD Test Guideline 474  
Result: negative

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

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

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

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

Test Type: gene mutation test  
Species: Rat (male)  
Cell type: Somatic  
Application Route: Oral  
Dose: 50,250,500,1000 mg/kg bw/day  
Method: OECD Test Guideline 488  
Result: negative

**silicon dioxide:**

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

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Genotoxicity in vivo : Application Route: Inhalation  
 Dose: 50 mg/m<sup>3</sup>  
 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

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)  
 Application Route: Inhalation  
 Exposure time: 13 Weeks  
 Dose: 1 - 50 mg/m<sup>3</sup>  
 Result: negative

Test Type: in vivo assay  
 Application Route: Oral  
 Exposure time: 6 h  
 Dose: 1%  
 Method: OECD Test Guideline 477  
 Result: negative

Germ cell mutagenicity - Assessment : Contains no ingredient listed as a mutagen

**Carcinogenicity****Components:****dibenzoyl peroxide:**

Species : Mouse, male and female  
 Application Route : Dermal  
 Exposure time : 104 weeks

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Result : negative

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

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

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

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

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

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

**silicon dioxide:**

Species : Rat, male and female  
 Application Route : Oral

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Exposure time : 103 weeks  
 Dose : 1800 - 3200 mg/kg  
 Frequency of Treatment : 7 daily  
 Method : OECD Test Guideline 453  
 Result : negative

**carbon black:**

Species : Mouse, female  
 Application Route : Inhalation  
 Exposure time : 13.5 month(s)  
 Dose : 7.5 - 12 mg/m<sup>3</sup>  
 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/m<sup>3</sup>  
 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/m<sup>3</sup>

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Frequency of Treatment : 16 hr/day, 5 d/wk  
 Method : OECD Test Guideline 451  
 Result : positive  
 Target Organs : Lungs

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  
 silicon dioxide 7631-86-9  
 (Silica dust, crystalline)

**OSHA** OSHA specifically regulated carcinogen  
 silicon dioxide 7631-86-9  
 (crystalline silica)

**NTP** Known to be human carcinogen  
 silicon dioxide 7631-86-9  
 (Silica, Crystalline (Respirable Size))

**Reproductive toxicity****Components:****dibenzoyl peroxide:**

Effects on fertility : Species: Rat, male and female  
 Application Route: Oral  
 Dose: 0, 250, 500, 1,000 mg/kg b.w/  
 General Toxicity - Parent: NOAEL: 500 mg/kg body weight  
 General Toxicity F1: NOAEL: 500 mg/kg body weight  
 Method: OECD Test Guideline 422

Effects on foetal development : Species: Rat  
 Dose: 100, 300 or 1000 mg/kg/day  
 General Toxicity Maternal: NOAEL: 300 mg/kg body weight  
 Developmental Toxicity: NOAEL: 300 mg/kg body weight  
 Method: OECD Test Guideline 414

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

Effects on fertility : Test Type: Two-generation study  
 Species: Rat, male and female  
 Application Route: Oral  
 Dose: 0, 50, 180, 540 or 750 milligram per kilogram  
 Duration of Single Treatment: 238 d  
 Frequency of Treatment: 1 daily  
 General Toxicity - Parent: NOEL: 540 mg/kg body weight  
 General Toxicity F1: NOEL: 750 mg/kg body weight  
 Symptoms: No adverse effects  
 Method: OECD Test Guideline 416  
 Result: No effects on fertility and early embryonic development were detected.

Effects on foetal : Species: Rabbit, female

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development

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

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

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

**silicon dioxide:**

Effects on foetal development

: Species: Mouse  
 Application Route: Oral  
 General Toxicity Maternal: NOAEL: 1,340 mg/kg body weight  
 Method: OECD Test Guideline 414  
 Result: No teratogenic effects

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

Species: Rat  
 Application Route: Oral  
 General Toxicity Maternal: NOAEL: 1,350 mg/kg body weight  
 Method: OECD Test Guideline 414  
 Result: No teratogenic effects

**STOT - single exposure**

No data available

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**STOT - repeated exposure****Components:****carbon black:**

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

**Repeated dose toxicity****Components:****dibenzoyl peroxide:**

Species : Rat, male and female  
NOAEL : > 100 mg/kg  
Application Route : Skin contact  
Number of exposures : 2 years  
Method : OECD Test Guideline 451

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

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

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

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

**silicon dioxide:**

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

**carbon black:**

Species : Mouse, male and female

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NOEL : > 1000000 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/m<sup>3</sup>  
 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/m<sup>3</sup>  
 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

**Aspiration toxicity**

No data available

**Experience with human exposure**

No data available

**Toxicology, Metabolism, Distribution**

No data available

**Neurological effects**

No data available

**Further information**

No data available

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



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

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

**dibenzoyl peroxide:**

Toxicity to fish : LC50 (Oncorhynchus mykiss (rainbow trout)): 0.0602 mg/l  
Exposure time: 96 h  
Test Type: semi-static test  
Test substance: Fresh water  
Method: OECD Test Guideline 203

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 0.11 mg/l  
Exposure time: 48 h  
Test Type: static test  
Test substance: Fresh water  
Method: OECD Test Guideline 202

Toxicity to algae/aquatic plants : EbC50 (Selenastrum capricornutum (green algae)): 0.0422 mg/l  
Exposure time: 72 h  
Test Type: static test  
Test substance: Fresh water  
Method: OECD Test Guideline 201

M-Factor (Acute aquatic toxicity) : 10

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : EC10 (Daphnia magna (Water flea)): 0.001 mg/l  
Exposure time: 21 d  
Test Type: semi-static test  
Method: OECD Test Guideline 211

M-Factor (Chronic aquatic toxicity) : 10

Toxicity to microorganisms : EC50 (activated sludge): 35 mg/l  
Exposure time: 0.5 h  
Test Type: static test  
Test substance: Fresh water  
Method: OECD Test Guideline 209

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

Toxicity to fish : LC50 (Oncorhynchus mykiss (rainbow trout)): 2 mg/l  
Exposure time: 96 h  
Method: OECD Test Guideline 203

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 1.8 mg/l  
Exposure time: 48 h  
Test Type: static test  
Test substance: Fresh water  
Method: OECD Test Guideline 202

Toxicity to algae/aquatic : EC50: 11 mg/l

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plants

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

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

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

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

**Ecotoxicology Assessment**

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

**silicon dioxide:**

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

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

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

**carbon black:**

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

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): > 5,600 mg/l  
 Exposure time: 24 h  
 Method: OECD Test Guideline 202

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

Toxicity to microorganisms : IC0: > 800 mg/l  
Exposure time: 3 h

**Persistence and degradability****Components:****dibenzoyl peroxide:**

Biodegradability : Inoculum: activated sludge  
Concentration: 4 mg/l  
Result: Readily biodegradable.  
Biodegradation: 68 %  
Exposure time: 28 d  
Method: OECD Test Guideline 301D

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

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

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

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

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

**carbon black:**

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

**Bioaccumulative potential****Components:****dibenzoyl peroxide:**

Partition coefficient: n-octanol/water : log Pow: 3.2 (72 °F / 22 °C)  
pH: 7.02  
Method: OECD Test Guideline 117

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

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

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

**carbon black:**

Bioaccumulation : Bioconcentration factor (BCF): 1

**Mobility in soil****Components:****dibenzoyl peroxide:**

Distribution among environmental compartments : Koc: 6309.57  
Method: OECD Test Guideline 121

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

Distribution among environmental compartments : Koc: 445

**Other adverse effects****Product:**

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

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

**SECTION 13. DISPOSAL CONSIDERATIONS****Disposal methods**

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

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

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

UN/ID No.	: UN 3077
Proper shipping name	: Environmentally hazardous substance, solid, n.o.s. (DIBENZOYL PEROXIDE)
Class	: 9
Packing group	: III
Labels	: Miscellaneous
Packing instruction (cargo aircraft)	: 956
Packing instruction (passenger aircraft)	: 956
Environmentally hazardous	: yes

**IMDG-Code**

UN number	: UN 3077
Proper shipping name	: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (DIBENZOYL PEROXIDE)
Class	: 9
Packing group	: III
Labels	: 9
EmS Code	: F-A, S-F
Marine pollutant	: yes

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

Not applicable for product as supplied.

**National Regulations****49 CFR**

UN/ID/NA number	: UN 3077
Proper shipping name	: Environmentally hazardous substance, solid, n.o.s. (DIBENZOYL PEROXIDE)
Class	: 9
Packing group	: III
Labels	: CLASS 9
ERG Code	: 171
Marine pollutant	: yes
Remarks	: Shipment by ground under DOT is non-regulated; however it may be shipped per the applicable hazard classification to facilitate multi-modal transport involving ICAO (IATA) or IMO.

**Special precautions for user**

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

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

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

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

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

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

dibenzoyl peroxide	94-36-0	>= 10 - < 20 %
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Fatty acids, C16-18, zinc salts	91051-01-3	>= 1 - < 5 %
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This product does not contain any hazardous air pollutants (HAP), as defined by the U.S. Clean Air Act Section 112 (40 CFR 61).

**California Prop. 65**

This product contains a chemical that is at or below California Propositions 65's "safe harbor level" as determined via a risk assessment. Therefore, the chemical is not required to be listed as a Prop 65 chemical on the SDS or label.

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

DSL	: This product contains one or several components that are not on the Canadian DSL nor NDSL.
AIIC	: Not 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	: Product contains substance(s) not listed on TSCA inventory.

**Inventories**

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

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

No substances are subject to a Significant New Use Rule.

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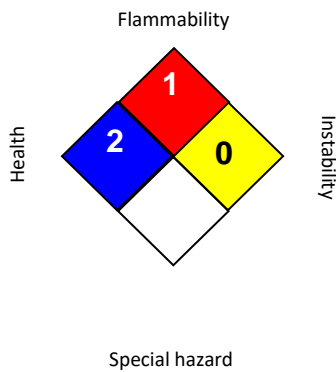
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**US. Toxic Substances Control Act (TSCA) Section 12(b) Export Notification (40 CFR 707, Subpt D)**  
 No substances are subject to TSCA 12(b) export notification requirements.

**SECTION 16. OTHER INFORMATION**

**Further information**

**NFPA 704:**



**HMIS® IV:**

<b>HEALTH</b>	<b>2</b>
<b>FLAMMABILITY</b>	<b>1</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

- Revision Date : 08/31/2022
- ACGIH : USA. ACGIH Threshold Limit Values (TLV)
- NIOSH REL : USA. NIOSH Recommended Exposure Limits
- OSHA CARC : OSHA Specifically Regulated Chemicals/Carcinogens
- OSHA P0 : USA. Table Z-1-A Limits for Air Contaminants (1989 vacated values)
- OSHA Z-1 : USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
- OSHA Z-3 : USA. Occupational Exposure Limits (OSHA) - Table Z-3 Mineral Dusts
- ACGIH / TWA : 8-hour, time-weighted average
- NIOSH REL / TWA : Time-weighted average concentration for up to a 10-hour workday during a 40-hour workweek
- OSHA CARC / PEL : Permissible exposure limit (PEL)
- OSHA P0 / 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.

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.

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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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