

**ARALDITE® 2023 ACTIVATOR**

Version 2.1      Revision Date: 12/17/2019      SDS Number: 400000007824      Date of last issue: 08/27/2019  
Date of first issue: 02/19/2019

Print Date 01/09/2020

**SECTION 1. IDENTIFICATION**

Product name : ARALDITE® 2023 ACTIVATOR

**Manufacturer or supplier's details**

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

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

Recommended use : Hardener  
Restrictions on use : For R&D use only. Not for pharmaceutical, household or other uses.

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

Organic peroxides : Type E  
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 : H242 Heating may cause a fire.  
H317 May cause an allergic skin reaction.

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H319 Causes serious eye irritation.

H410 Very toxic to aquatic life with long lasting effects.

## Precautionary statements

: **Prevention:**

P210 Keep away from heat/sparks/open flames/hot surfaces.

No smoking.

P220 Keep/Store away from clothing/ combustible materials.

P234 Keep only in original container.

P261 Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.

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.

P363 Wash contaminated clothing before reuse.

P391 Collect spillage.

**Storage:**

P410 Protect from sunlight.

P411 + P235 Store at temperatures not exceeding .? °C/ .? °F.

Keep cool.

P420 Store away from other materials.

**Disposal:**

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

**Other hazards**

None known.

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

Substance / Mixture : Mixture

Chemical nature : Organic Peroxides, Solid

**Hazardous components**

| Chemical name   | CAS-No.   | Concentration (% w/w) |
|---|-----------|-----------------------|
| dibenzoyl peroxide  | 94-36-0   | 20 - 25               |
| silicon dioxide   | 7631-86-9 | 1 - 5                 |
| 2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane | 1675-54-3 | 2.5 - 5               |
| Oxirane, methyl-, polymer with oxirane, monobutyl ether             | 9038-95-3 | 1 - 5                 |
| carbon black  | 1333-86-4 | 0.1 - 1               |

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

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

**SECTION 4. FIRST AID MEASURES**

- General advice : Move out of dangerous area.  
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 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
- Specific hazards during firefighting : Do not allow run-off from fire fighting to enter drains or water courses.
- Hazardous combustion products : Carbon oxides  
Halogenated compounds

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- 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.  
Avoid dust formation.  
Avoid breathing dust.  
Remove all sources of ignition.  
Refer to protective measures listed in sections 7 and 8.
- Environmental precautions : Prevent product from entering drains.  
Prevent further leakage or spillage if safe to do so.  
If the product contaminates rivers and lakes or drains inform respective authorities.
- Methods and materials for containment and cleaning up : Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13).  
Keep in suitable, closed containers for disposal.

**SECTION 7. HANDLING AND STORAGE**

- Advice on protection against fire and explosion : Provide appropriate exhaust ventilation at places where dust is formed.  
Keep away from open flames, hot surfaces and sources of ignition.
- Advice on safe handling : 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.  
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.

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- Conditions for safe storage : Store in cool place.  
 Keep in a 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 : 41 - 86 °F / 5 - 30 °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   |           |
|--------------------|-----------|-------------------------------|--|---|-----------|
| 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 |
| 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 |
| carbon black       | 1333-86-4 | TWA (Inhalable fraction)      | 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 |

**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

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circumstance where air purifying respirators may not provide adequate protection.

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 : 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 : black

Odour : slight

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

pH : No data is available on the product itself.

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

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

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

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

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.

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

Density : 1.1 - 1.2 g/cm<sup>3</sup>

Solubility(ies)  
Water solubility : insoluble

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

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

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

Thermal decomposition : No data is available on the product itself.

Self-Accelerating decomposition temperature (SADT) : 122 °F / 50 °C

Viscosity  
Viscosity, dynamic : 90,000 - 110,000 mPa.s

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 : Dust may form explosive mixture in air.

Conditions to avoid : Heat, flames and sparks.

Incompatible materials : None known.

Hazardous decomposition products : carbon dioxide  
carbon monoxide  
Halogenated compounds

**SECTION 11. TOXICOLOGICAL INFORMATION**

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

**Acute toxicity**

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

**Components:**

dibenzoyl peroxide:

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

silicon dioxide:

Acute inhalation toxicity : LC50 (Rat, male and female): > 58.8 mg/l  
Exposure time: 4 h  
Test atmosphere: dust/mist  
Method: OECD Test Guideline 403

carbon black:

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

**Components:**

silicon dioxide:

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

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

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

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

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

dibenzoyl peroxide:

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

silicon dioxide:

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



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Result: No skin irritation

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

Species: Rabbit

Assessment: Mild skin irritant

Method: OECD Test Guideline 404

Result: Irritating to skin.

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

silicon dioxide:

Species: Rabbit

Result: No eye irritation

Assessment: No eye irritation

Method: OECD Test Guideline 405

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

Species: Rabbit

Result: Irritating to eyes.

Assessment: Mild eye irritant

Method: OECD Test Guideline 405

Oxirane, methyl-, polymer with oxirane, monobutyl ether:

Assessment: Irritating to eyes.

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:

Exposure routes: Skin

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

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.

Assessment: No data available

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

dibenzoyl peroxide:  
 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

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

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:  
 Genotoxicity in vitro : Metabolic activation: with and without metabolic activation  
 Method: OECD Test Guideline 476  
 Result: positive

Concentration: 0 - 5000 ug/plate  
 Metabolic activation: with and without metabolic activation  
 Method: OECD Test Guideline 471  
 Result: positive

carbon black:

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

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

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

**Components:**

dibenzoyl peroxide:  
 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

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

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:  
 Genotoxicity in vivo : Cell type: Germ  
 Application Route: Oral  
 Method: OECD Test Guideline 478  
 Result: negative

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

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

Test Type: in vivo assay  
 Species: Rat (females)  
 Application Route: Inhalation  
 Exposure time: 13 Weeks

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Dose: 1 - 50 mg/m3  
Result: negative

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

**Components:**

carbon black:  
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  
Result: negative

silicon dioxide:  
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

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

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

Species: Rat, female  
Application Route: Dermal  
Exposure time: 24 month(s)  
Dose: 1 mg/kg  
Frequency of Treatment: 5 days/week

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

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Target Organs: Lungs

**Components:**

carbon black:

Carcinogenicity -  
Assessment

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

**IARC**

Group 1: Carcinogenic to humans  
silicon dioxide  
(Silica dust, crystalline)

Group 2B: Possibly carcinogenic to humans  
carbon black

**ACGIH**

Confirmed animal carcinogen with unknown relevance to humans

carbon black

**OSHA**

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

**NTP**

Known to be human carcinogen  
silicon dioxide  
(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: No observed adverse effect level:  
500 mg/kg body weight  
General Toxicity F1: No observed adverse effect level: 500  
mg/kg body weight  
Method: OECD Test Guideline 422

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

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

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**Components:**

dibenzoyl peroxide:  
Effects on foetal  
development

: Species: Rat  
Dose: 100, 300 or 1000 mg/kg/day  
General Toxicity Maternal: No observed adverse effect level:  
300 mg/kg body weight  
Developmental Toxicity: No observed adverse effect level:  
300 mg/kg body weight  
Method: OECD Test Guideline 414

silicon dioxide:

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

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

Species: Rabbit, female  
Application Route: Dermal  
General Toxicity Maternal: No observed adverse effect level:  
30 mg/kg body weight  
Method: Other guidelines  
Result: No teratogenic effects

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

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

Reproductive toxicity -  
Assessment : No data available

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**STOT - single exposure**

No data available

**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: &gt; 100 mg/kg

Application Route: Skin contact

Number of exposures: 2 years

Method: OECD Test Guideline 451

silicon dioxide:

Species: Rat, male and female

NOEC: 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

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

Species: Rat, male and female

NOAEL: 50 mg/kg

Application Route: Ingestion

Exposure time: 14 Weeks

Number of exposures: 7 d

Method: Subchronic toxicity

Species: Rat, male and female

NOEL: 10 mg/kg

Application Route: Skin contact

Exposure time: 13 Weeks

Number of exposures: 5 d

Method: Subchronic toxicity

Species: Mouse, male

NOAEL: 100 mg/kg

Application Route: Skin contact

Exposure time: 13 Weeks

Number of exposures: 3 d

Method: Subchronic toxicity



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carbon black:

Species: Mouse, male and female  
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: Continously  
Dose: 2.05 g/kg

Species: Mouse, females  
NOEL: 137 mg/kg  
Application Route: oral (feed)  
Exposure time: 52 Weeks  
Number of exposures: Continously  
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

Repeated dose toxicity - : No data available  
Assessment

**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

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Ingestion:                      No data available

**Toxicology, Metabolism, Distribution**

No data available

**Neurological effects**

No data available

**Further information**

Ingestion:                      No data available

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

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

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

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

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

**Components:**

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

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## silicon dioxide:

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

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

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 2.7 mg/l  
Exposure time: 48 h  
Test Type: static test  
Test substance: Fresh water

## carbon black:

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

**Components:**

## dibenzoyl peroxide:

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

## silicon dioxide:

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

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

Toxicity to algae/aquatic plants : EC50 (Selenastrum capricornutum (green algae)): 9.4 mg/l  
Exposure time: 72 h  
Test Type: static test  
Test substance: Fresh water  
Method: EPA-660/3-75-009

## carbon black:

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

**Components:**

## dibenzoyl peroxide:

M-Factor (Acute aquatic toxicity) : 10  
Toxicity to fish (Chronic toxicity) : No data available

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**Components:**

dibenzoyl peroxide:  
 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

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

**Components:**

dibenzoyl peroxide:  
 M-Factor (Chronic aquatic toxicity) : 10

**Components:**

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

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

Toxicity to soil dwelling organisms : No data available

Plant toxicity : No data available

Sediment toxicity : No data available

Toxicity to terrestrial organisms : No data available

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 : No data available

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the environment

**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 : Inoculum: Sewage (STP effluent)  
 Concentration: 20 mg/l  
 Result: Not readily biodegradable.  
 Biodegradation: 5 %  
 Exposure time: 28 d  
 Method: OECD Test Guideline 301F

carbon black:

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

**Components:**

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

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

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

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

Photodegradation : No data available

Impact on Sewage Treatment : No data available

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

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:  
 Bioaccumulation : Bioconcentration factor (BCF): 31  
 Remarks: Does not bioaccumulate.

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

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

**Mobility in soil**

Mobility : No data available

**Components:**

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  
 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

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Adsorbed organic bound halogens (AOX) : No data available

**Hazardous to the ozone layer**

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

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

Global warming potential (GWP) : No data available

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

Waste from residues : The product should not be allowed to enter drains, water courses or the soil.  
Do not contaminate ponds, waterways or ditches with chemical or used container.  
Send to a licensed waste management company.  
Dispose of as hazardous waste in compliance with local and 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 3108  
Proper shipping name : Organic peroxide type E, solid (DIBENZOYL PEROXIDE)  
Class : 5.2  
Packing group : Not assigned by regulation  
Labels : Division 5.2 - Organic peroxides, Handling Label - Keep Away From Heat

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Packing instruction (cargo aircraft) : 570  
 Packing instruction (passenger aircraft) : 570

**IMDG**

UN number : UN 3108  
 Proper shipping name : ORGANIC PEROXIDE TYPE E, SOLID (DIBENZOYL PEROXIDE)  
 Class : 5.2  
 Packing group : Not assigned by regulation  
 Labels : 5.2  
 EmS Code : F-J, S-R  
 Marine pollutant : yes

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

Not applicable for product as supplied.

**National Regulations****DOT Classification**

UN/ID/NA number : UN 3108  
 Proper shipping name : ORGANIC PEROXIDE TYPE E, SOLID (DIBENZOYL PEROXIDE)  
 Class : 5.2  
 Packing group : II  
 Labels : Division 5.2 - Organic peroxides  
 ERG Code : 145  
 Marine pollutant : yes(DIBENZOYL PEROXIDE)

**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**

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

**SARA 311/312 Hazards** : Organic peroxides  
 Serious eye damage or eye irritation  
 Respiratory or skin sensitisation

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

|                    |         |                |
|--------------------|---------|----------------|
| dibenzoyl peroxide | 94-36-0 | >= 20 - < 30 % |
|--------------------|---------|----------------|

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



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**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:**

|        |  |
|--------|--|
| TSCA   | : On the inventory, or in compliance with the inventory                                      |
| CH INV | : The formulation contains substances listed on the Swiss Inventory                          |
| DSL    | : This product contains one or several components that are not on the Canadian DSL nor NDSL. |
| AICS   | : Not in compliance with the inventory   |
| NZIoC  | : On the inventory, or in compliance with the inventory                                      |
| ENCS   | : Not in compliance with the inventory   |
| IECSC  | : On the inventory, or in compliance with the inventory                                      |
| KECI   | : Not in compliance with the inventory   |
| PICCS  | : Not in compliance with the inventory   |
| TCSI   | : 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.

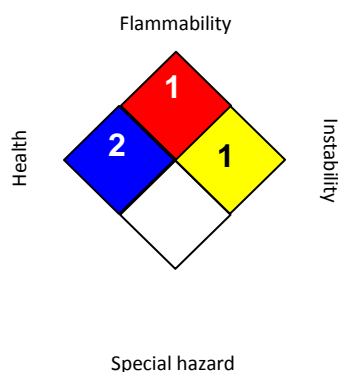
**US. Toxic Substances Control Act (TSCA) Section 12(b) Export Notification (40 CFR 707, Subpt D)**

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>1</b> |
| <b>PHYSICAL HAZARD</b> |  | <b>1</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   | : 12/17/2019   |
| 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<br>Limits for Air Contaminants          |
| OSHA Z-3        | : USA. Occupational Exposure Limits (OSHA) - Table Z-3<br>Mineral Dusts                        |
| ACGIH / TWA     | : 8-hour, time-weighted average  |
| NIOSH REL / TWA | : Time-weighted average concentration for up to a 10-hour<br>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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