

Safety Data Sheet Kronos - 10™

ACC. TO OSHA HCS

1 IDENTIFICATION OF THE PRODUCT AND THE COMPANY OR UNDERTAKING

Product Identifier

Trade Name: Kronos-10™

Application of the Substance or Mixture Epoxy Resin

Details of the Supplier of the Safety Data Sheet (SDS)

Designed and Developed By: Plasma Ruggedized Solutions, Inc.
 2284 Ringwood Ave. Suite A
 San Jose, CA 95131
 1 (408) 954-8405
 www.plasmarugged.com

Information Department:

Product Safety Department:
 msds@plasmarugged.com

Emergency Telephone Number:

North America - Chemtrec: 1 (800) 424-9300 (24 hours)
 International - Chemtrec: 01 (703) 527-3887 (24 hours)

2 HAZARD(S) IDENTIFICATION

Hazard Classification

Skin Irrit.	2	H315	Causes skin irritation.
Eye Dam.	1	H318	Causes serious eye damage.
Resp. Sens.	1	H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled.
Skin Sens.	1	H317	May cause an allergic skin reaction.

Label Elements

- GHS label elements The product is classified and labeled according to the Globally Harmonized System (GHS).
- Pictogram(s)



GHS05 GHS08

Signal Word Danger

Hazard-Determining Component(s)

Hexahydro-4-methylphthalic anhydride
 Bisphenol-A-(epichlorohydrin) epoxy resin
 (3,4-Epoxy cyclohexyl)methyl 3,4-epoxycyclohexylcarboxylate

Hazard Statements

H315 Causes skin irritation.
 H318 Causes serious eye damage.
 H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.
 H317 May cause an allergic skin reaction.

Precautionary Statements

In case of inadequate ventilation wear respiratory protection.
 Avoid breathing dust/fume/gas/mist/vapors/spray.
 Wear protective gloves/eye protection/face protection.
 Wash thoroughly after handling.
 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
 If experiencing respiratory symptoms: Call a POISON CENTER/doctor.
 Wash contaminated clothing before reuse.
 If inhaled: If breathing is difficult, remove person to fresh air and keep comfortable for breathing.
 If skin irritation or rash occurs: Get medical advice/attention.
 IF ON SKIN: Wash with plenty of water.
 Dispose of contents/container in accordance with local/regional/national/international regulations.

Hazard Rating System

NFPA System

NFPA Ratings (scale 0 - 4)



Health = 2
 Fire = 1
 Reactivity = 0

NFPA special hazards (water reactivity and oxidizing property): None

HMIS System

HMIS Ratings (scale 0 - 4)

HEALTH	*2
FIRE	1
REACTIVITY	0

Health = *2
 Fire = 1
 Reactivity = 0

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Other Hazards

Results of PBT and vPvB assessment

- **PBT:** Not applicable.
- **vPvB:** Not applicable.

3 COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Characterization: Mixtures

Composition/Information on Ingredients

CAS: 19438-60-9 EINECS: 243-072-0 Index Number: 607-241-00-6	hexahydro-4-methylphthalic anhydride Resp. Sens. 1, H334 Eye Dam. 1, H318 Acute Tox. 4, H332; Skin Sens. 1, H317	30-40%
CAS: 25068-38-6 NLP: 500-033-5 Index Number: 603-074-00-8	Bisphenol-A-(epichlorohydrin) epoxy resin Aquatic Chronic 2, H411 Skin Irrit. 2, H315; Eye Irrit. 2A, H319; Skin Sens. 1, H317	25-30%
CAS: 2386-87-0 EINECS: 219-207-4	(3,4-Epoxy-cyclohexyl)methyl 3,4-epoxy-cyclohexylcarboxylate Skin Sens. 1, H317 Aquatic Acute 3, H402	5- <10%
CAS: 2530-83-8 EINECS: 219-784-2 RTECS: VV 4025000	Glycidyoxypropyltrimethoxysilane Eye Dam. 1, H318	0.1- <1%
CAS: 1330-20-7 EINECS: 215-535-7 Index Number: 601-022-00-9 RTECS: ZE 2100000	Xylene Flam. Liq. 3, H226 Acute Tox. 4, H312; Acute Tox. 4, H332; Skin Irrit. 2, H315	0.1-1%
CAS: 1333-86-4 EINECS: 215-609-9 RTECS: FF5800000	Carbon black (wetted form)	0.1-0.5%
CAS: 100-41-4 EINECS: 202-849-4 Index Number: 601-023-00-4 RTECS: DA 0700000	Ethylbenzene Flam. Liq. 3, H226 Acute Tox. 4, H332	0- <0.1%
CAS: 108-88-3 EINECS: 203-625-9 Index Number: 601-021-00-3 RTECS: XS 5250000	Toluene Flam. Liq. 2, H225 Repr. 2, H361; STOT RE 2, H373; Asp. Tox. 1, H304 Skin Irrit. 2, H315; STOT SE 3, H336	0- <0.1%

Classification System: The Classifications were based on the Toxicological and Ecological Data of the substances/mixtures in the Section 11 and 12.

Additional Information: If the chemical name/CAS number is proprietary and or weight percentage is listed as a range, the specific chemical identity and or percentage of composition has been withheld as a trade secret.

4 FIRST-AID MEASURES

Description of First Aid Measures

General Information: Ensure medical personnel are aware of exposure and take precautions for their personal protection; see Section 8 for the information of personal protection.

After Inhalation: Remove victim from exposure to fresh air. Keep person at rest. Provide oxygen if person is not breathing.

Seek medical advice if any symptoms develop. In case of unconsciousness place patient stably in side position for transportation.

After Skin Contact: Remove all contaminated clothing and wash before reuse. Wash contaminated skin with water and soap and rinse thoroughly. Get medical attention.

After Eye Contact: Immediately rinse opened eyes for at least 15 minutes under running water. Immediately remove contact lenses if present. Continue rinsing. Seek medical advice. Do not put any ointments, oils or medication in eyes without specific instructions.

After Swallowing: If victim is unconscious; never give anything by mouth. If victim is conscious; rinse out mouth and give victim small amounts of water. Seek medical treatment in case of complaints.

After Exposure: Get medical advice/attention at once.

Information for Doctor: Have chemical containers, labels and/or (M)SDS ready when calling or visiting a medical center.

Indication of any Immediate Medical Attention and Special Treatment Needed.

Check section 11 Toxicological Information for further relevant information.

Additional Information: For additional information, please consult the corresponding first aid measures in the most current version of Emergency Response Guidebook which is produced by the US Department of Transportation.

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5 FIREFIGHTING MEASURES

Extinguishing Media

· Suitable Extinguishing Agent(s)

Use fire fighting measures and extinguishing agents that suit the environment. In case of fire, suitable extinguishing agents are:

Alcohol resistant foam.

Dry chemical or fire-extinguishing powder.

Carbon dioxide (CO₂).

Water spray or water fog.

· Unsuitable Extinguishing Agent(s) Water with full jet

· Firefighting Procedures

Isolate fire and deny unnecessary entry.

Immediately withdraw all personnel from the area in case of rising sound from venting safety device.

Eliminate all ignition sources if safe to do so.

Do not extinguish fire unless flow can be stopped.

Burning liquids may be moved by flushing with water; protect personnel and minimize property damage.

Fight fire from protected location or safe distance.

Contain fire water runoff if possible to prevent environmental pollution.

· Special Hazards Arising in Fire

Will not burn unless preheated.

In case of fire, following can be released:

Phenolic compounds

Carbon dioxide (CO₂) and Carbon monoxide (CO)

Aluminum oxide (Al₂O₃) dust, a serious respiratory irritant, may be formed during fires.

· Advice for Firefighters

If employees are expected to fight fires, they must be trained and equipped as stated in the OSHA fire brigades standard (29 CFR1910.156).

As with any fire, wear positive-pressure self-contained breathing apparatus and full protective gear that are NIOSH approved.

· Additional Information Caution! Finely dispersed substance may form explosive mixtures in air.

6 ACCIDENTAL RELEASE MEASURES

Personal Precautions

Do not breathe gas, vapors, dusts or mists if their inhalable particles occur during use.

Ensure personnel take precautions for their personal protection during clean up; see Section 8 for the specific requirements.

· Environmental Precautions No further relevant information.

· Cleaning Up Methods

Ensure adequate ventilation.

Eliminate all ignition sources.

Keep unauthorized personnel away.

For large spills:

Shut off source of leak if safe to do so.

Dike and contain.

Remove with vacuum trucks or pump to storage/salvage vessels.

Absorb residues with liquid-binding materials.

Avoid confined spaces, such as sewers, because of the possibility of an explosion.

For small spills:

Ventilate and wash area after clean-up is complete.

Collect spills in suitable and properly labeled containers.

Do not use solvents unless following safe handling practices and within the recommended exposure guidelines.

Dispose contaminated chemicals as waste according to Section 13.

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· Protective Action Criteria for Chemicals

PAC-1

25068-38-6	Bisphenol-A-(epichlorohydrin) epoxy resin	90 mg/m3
21645-51-2	Aluminum hydroxide	8.7 mg/m3
2530-83-8	Glycidyoxypropyltrimethoxysilane	9.3 mg/m3
1330-20-7	Xylene	130 ppm
1333-86-4	Carbon black (wetted form)	9 mg/m3
100-41-4	Ethylbenzene	33 ppm
108-88-3	Toluene	67 ppm

PAC-2

25068-38-6	Bisphenol-A-(epichlorohydrin) epoxy resin	990 mg/m3
21645-51-2	Aluminum hydroxide	73 mg/m3
2530-83-8	Glycidyoxypropyltrimethoxysilane	100 mg/m3
1330-20-7	Xylene	920* ppm
1333-86-4	Carbon black (wetted form)	99 mg/m3
100-41-4	Ethylbenzene	1100* ppm
108-88-3	Toluene	560 ppm

PAC-3

25068-38-6	Bisphenol-A-(epichlorohydrin) epoxy resin	5,900 mg/m3
21645-51-2	Aluminum hydroxide	440 mg/m3
2530-83-8	Glycidyoxypropyltrimethoxysilane	230 mg/m3
1330-20-7	Xylene	2500* ppm
1333-86-4	Carbon black (wetted form)	590 mg/m3
100-41-4	Ethylbenzene	1800* ppm
108-88-3	Toluene	3700* ppm

7 HANDLING AND STORAGE

Handling

· Precautions for Safe Handling

- Avoid any body contact of containers or contents unless wearing appropriate personal protective equipment.
- Keep away from incompatible material(s).
- Avoid any release into the environment. Do not breathe dust created by sanding, grinding or machining.
- For industrial or professional use only
- Observe all the personal protection requirements in Section 8.

· Information about Protection Against Explosions and Fires

- Keep away from heat, sparks, open flame and other ignition sources during handling.
- Dust can combine with air to form an explosive mixture.

· Storage

· Requirements to be Met by Storerooms and Receptacles

- Store in a well-ventilated place; provide ventilation for receptacles.
- Keep stored in accordance with local, regional, national, and international regulations.

Additional Information: No further relevant information.

· Information about Storage in One Common Storage Facility

- Store away from incompatible material(s).
- Store away from foodstuffs.
- Avoid release to the environment.

· Additional Information No further relevant information.

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8 EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Measures or Controls

Exposure Limit Values that Require Monitoring at the Workplace

The following constituents are the only constituents of the product which have a PEL, TLV or other recommended exposure limit. At this time, the other constituents have no known exposure limits.

2530-83-8 Glycidylxypropyltrimethoxysilane

DCC OEL TWA | Short-term value: 0.5 mg/m³

1330-20-7 Xylene

PEL	Long-term value: 435 mg/m ³ , 100 ppm
REL	Short-term value: 655 mg/m ³ , 150 ppm
	Long-term value: 435 mg/m ³ , 100 ppm
TLV	Short-term value: 651 mg/m ³ , 150 ppm
	Long-term value: 434 mg/m ³ , 100 ppm
	BEI

1333-86-4 Carbon black (wetted form)

PEL	Long-term value: 3.5 mg/m ³
REL	Long-term value: 3.5* mg/m ³
	*0.1 in presence of PAHs; See Pocket Guide Apps.A+C
TLV	Long-term value: 3* mg/m ³
	*inhalable fraction

100-41-4 Ethylbenzene

PEL	35 mg/m ³ , 100 ppm
REL	Short-term value: 545 mg/m ³ , 125 ppm
	Long-term value: 435 mg/m ³ , 100 ppm
TLV	Long-term value: 87 mg/m ³ , 20 ppm
	BEI

108-88-3 Toluene

PEL	Long-term value: 200 ppm
	Ceiling limit value: 300; 500* ppm
	*10-min peak per 8-hr shift
REL	Short-term value: 560 mg/m ³ , 150 ppm
	Long-term value: 375 mg/m ³ , 100 ppm
TLV	Long-term value: 75 mg/m ³ , 20 ppm
	BEI

Other Engineering Measures or Controls

Ventilation rates should be matched to conditions.

If applicable, use process enclosure(s), local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits.

Personal Protective

General Protective and Hygienic Measures

- Avoid any contact with skin or eye.
- Do not eat, drink or smoke during work.
- Clean hands and exposed skin thoroughly after work and before breaks.

Personal Protective Equipment (PPE)

Breathing Equipment

Sufficient ventilation in pattern and volume should be provided in order to maintain air contaminant levels below recommended exposure limits. Use a NIOSH approved air-purifying organic vapor respirator if occupational limits are exceeded. For emergency situations, confined space use, or other conditions where exposure limits may be greatly exceeded, use an approved air supplied respirator. Observe OSHA regulations (29CFR 1910.134) for respirator use.

Hand Protection: Selection of glove material should take into consideration the penetration times, rates of diffusion, and the degradation.

Eye Protection: safety glasses with side shields and or face shield.



Protective gloves
Nitrile Gloves
Butyl Rubber Gloves



Safety glasses

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Body Protection: Chemical resistant apron; cover exposed skin. Appropriate chemical resistant clothing.

Additional Information: All protective clothing (suits, gloves, footwear, headgear) should be clean, available every day, and put on before work. The Engineering measures or controls, and PPE recommendations are only guidelines and may not apply to every situation. For additional information, please consult the corresponding requirements under OSHA 29 CFR 1910.94-95, and 29 CFR 1910.132-138.

9 PHYSICAL AND CHEMICAL PROPERTIES

Information on Basic Physical and Chemical Properties

- **Appearance:** _____
- **Form:** Liquid _____
- **Color:** Black _____
- **Odor:** Characteristic _____
- **Odor Threshold:** Not determined _____

PH-Value **Not determined**

- **Change in Condition:** _____
- **Melting Point:** Not determined _____
- **Boiling Point:** Not determined _____
- **Flash Point:** >135 °C (>275 °F) _____
- **Decomposition Temperature:** Not determined _____
- **Auto-ignition Temperature:** Not determined _____
- **Flammability:** Not determined _____
- **Explosion:** Not determined _____
- **Explosion Limits:** _____
- **Lower:** Not determined _____
- **Upper:** Not determined _____
- **Vapor Pressure:** Not determined _____
- **Vapor Density:** Not determined _____
- **Density at 20 °C (68 °F):** 1.4 g/cm³ (11.683 lbs/gal) _____
- **Solubility in or Miscibility with** _____
- **Water:** Not miscible or difficult to mix _____
- **Viscosity:** _____
- **Dynamic:** Not determined _____
- **Kinematic:** Not determined _____
- **Additional Information** No further relevant information

10 STABILITY AND REACTIVITY

- **Physical Hazard(s)** Not a regulated reactive or physical hazard under GHS.
- **Hazardous Reactivity and Chemical Stability** Stable under normal conditions of use, storage and temperatures.
- **Thermal Decomposition and Conditions to be Avoided** _____
 Keep away from incompatible material(s).
 Thermally decomposes during fire or high heat; keep away from heat, sparks, open flame and other ignition sources.
- **Possibility of Other Hazardous Reaction(s)** No further relevant information available.
- **Incompatible Material(s)** _____
 Oxidizing agents
 Acids
 Chlorinated rubber
 Bases (Alkalis)
- **Hazardous Decomposition Product(s)** _____
 Thermally decomposes during fire or very high heat. See Section 5 for fire hazards evolved during thermal decomposition.
- **Hazardous Polymerization Product(s)** No relevant information.
 Additional Information No further relevant information.

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11 TOXICOLOGICAL INFORMATION

· Acute Toxicity

· Oral

25068-38-6 Bisphenol-A-(epichlorohydrin) epoxy resin

Oral	LD50	11400 mg/kg (rat)
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21645-51-2 Aluminum hydroxide

Oral	LD50	(rat) (LD0(OECD TG 401)>5000mg/kg: no death occurred) No mortality was observed after a single oral administration with 5000 mg/kg of the substance. Reference: ECHA (2011) and IUCLID Dataset (2000).
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2386-87-0 (3,4-Epoxy cyclohexyl)methyl 3,4-epoxy cyclohexylcarboxylate

Oral	LD50	≥ 5000 mg/kg (rat) (OECD TG 401; neat substance) 4490 mg/kg (rat) (test guideline not available) Reference: ChemID (2012)
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1333-86-4 Carbon black (wetted form)

Oral	LD50	> 10000 mg/kg (rat) (Toxicity not anticipated under normal conditions)
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· Potential Health Effect(s): Not a classified acute oral hazard.

· Dermal

25068-38-6 Bisphenol-A-(epichlorohydrin) epoxy resin

Dermal	LD50	20000 mg/kg (rabbit) (Test guideline not available)
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21645-51-2 Aluminum hydroxide

Dermal	LD50	(Test species: n/a) (Toxicity not expected based on acute oral data)
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2386-87-0 (3,4-Epoxy cyclohexyl)methyl 3,4-epoxy cyclohexylcarboxylate

Dermal	LD50	23400 mg/kg (rat) (Estimated from LD50 of 20ml/kg) > 2000 mg/kg (rat) (OECD TG 402; semioclusive; neat substance) There were no deaths, clinical signs of reaction, or any macroscopic changes observed during the study; the substance was not expected to pose an acute dermal toxicity. Reference: ChemID (2012) and ECHA (2012).
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1333-86-4 Carbon black (wetted form)

Dermal	LD50	> 3000 mg/kg (Test species: n/a) (Toxicity not anticipated under normal conditions)
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· Potential Health Effect(s): Not a classified acute dermal hazard.

· Inhalative

25068-38-6 Bisphenol-A-(epichlorohydrin) epoxy resin

Inhalative	LC50/4 h	(Test species: n/a) (Toxicity not expected based on the acute oral data)
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21645-51-2 Aluminum hydroxide

Inhalative	LC50/4 h	(Test species: n/a) (Toxicity not expected as a wetted form) Due to wetted form, inhalative effects of the substance can be seen as negligible.
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2386-87-0 (3,4-Epoxy cyclohexyl)methyl 3,4-epoxy cyclohexylcarboxylate

Inhalative	LC50/4 h	(rat) (LC0≥5.19mg/l (aerosol; OECD TG 436; both sexes)) No animals died or showed any persistent clinical signs attributable to the test substance; it was therefore not considered as an acute inhalative hazard. Reference: ECHA (2012).
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1333-86-4 Carbon black (wetted form)

Inhalative	LC50/4 h	not classified mg/l (Test species: n/a) (Toxicity not expected based on acute oral data)
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· Potential Health Effect(s):

headache

nausea

vomiting

passing out

suffocation

Not a classified acute inhalative hazard.

· Skin Corrosion or Irritation

25068-38-6 Bisphenol-A-(epichlorohydrin) epoxy resin

Corrosion/Irritation	irritating (rabbit)
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21645-51-2 Aluminum hydroxide

Corrosion/Irritation	not irritating (rabbit) (OECD TG 404; semioclusive; 4hr-contact; undiluted)
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2386-87-0 (3,4-Epoxy cyclohexyl)methyl 3,4-epoxycyclohexylcarboxylate

Corrosion/Irritation	slightly irrit. (rabbit) (0.5ml neat substance; OECD TG 404; occlusive) Minor erythema was observed on all 6 rabbits directly after the 4 hour contact but was fully reversible by day 14. Minor but quickly reversible transient oedema was evident on 3 animals. Reference: ECHA (2012).
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1333-86-4 Carbon black (wetted form)

Corrosion/Irritation	not irritating (rabbit) (None showed any signs of skin irritation)
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· Potential Health Effect(s):

Causes skin irritation.
In contact with skin, may cause:
redness and pain

· Eye Serious Damage or Irritation

25068-38-6 Bisphenol-A-(epichlorohydrin) epoxy resin

Damage/Irritation	irritating (rabbit)
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21645-51-2 Aluminum hydroxide

Damage/Irritation	not irritating (rabbit) No eye irritation to rabbit eyes OECD Test Guideline 405
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2386-87-0 (3,4-Epoxy cyclohexyl)methyl 3,4-epoxycyclohexylcarboxylate

Damage/Irritation	slightly irrit. (rabbit) (OECD TG 405; 0.1ml neat substance) No corneal injury or iritis in any of the four treated rabbits was observed. Minor irritation was exhibited in all four animals within one hour after application, but it was fully reversible within 72 hours to 9 days. Reference: ECHA (2012).
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1333-86-4 Carbon black (wetted form)

Damage/Irritation	slightly irrit. (rabbit) (discoloration of lids and slight conjunctiva)
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· Potential Health Effect(s):

Causes serious eye damage.
In contact with eye, may cause:
decrease or loss of vision
redness, pain and severe deep burns

· Respiratory or Skin Sensitization

25068-38-6 Bisphenol-A-(epichlorohydrin) epoxy resin

Sensitization	Skin	sensitizing (Human)
	Respiratory	(No data available)

21645-51-2 Aluminum hydroxide

Sensitization	Skin	not sensitizing (guinea pig) (OECD TG 406; intradermal and epicutaneous) Skin sensitizing reaction was not observed; the substance was not classified as a skin sensitizer. Reference: ECHA (2011).
	Respiratory	(No data available) Due to wetted form, inhalative effects of the substance can be seen as negligible.

2386-87-0 (3,4-Epoxy cyclohexyl)methyl 3,4-epoxycyclohexylcarboxylate

Sensitization	Skin	Sensitizing (guinea pig) (OECD TG 406; intradermal and epicutaneous) Sensitizing number: 11 (19 treated animals; Time point: 24 hours) Sensitizing number: 8 (19 treated animals; Time point: 48 hours) The substance was therefore determined to be a moderate dermal sensitizer (Category 1). Reference: ECHA (2012). Respiratory (No data available)
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1333-86-4 Carbon black (wetted form)

Sensitization	Skin	not sensitizing (Human) (There were no allergies reported in humans)
	Respiratory	(No data available)

· Potential Health Effect(s):

May cause an allergic skin reaction.
May cause allergy or asthma symptoms or breathing difficulties if inhaled.

· OSHA-Ca (Occupational Safety & Health Administration)

None of the ingredients is listed.

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· Germ Cell Mutagenicity

25068-38-6 Bisphenol-A-(epichlorohydrin) epoxy resin

Mutagenicity positive (Chinese hamster lung fibroblast cells) (In Vitro (Chromosomal Aberration))

21645-51-2 Aluminum hydroxide

Mutagenicity negative (rat)

Mouse lymphocyte/Result: negative/Mutagenicity (micronucleus test) Rat - male/result: negative

2386-87-0 (3,4-Epoxy cyclohexyl)methyl 3,4-epoxycyclohexylcarboxylate

Mutagenicity negative (rat) (In Vivo (DNA damage and/or repair; OECD TG 486))

In Vitro (S. typhimurium TA 1535 and TA100) - positive with metabolic activation; negative without metabolic activation.

In Vitro (S. typhimurium TA 1537, and TA 98; and E. coli WP2 uvr A) - negative with and without metabolic activation.

In Vitro (Mammalian cell gene mutation assay; mouse lymphoma L5178Y cells) - positive with and without metabolic activation.

In Vitro (Mammalian cell gene mutation assay; Chinese hamster Ovary (CHO)) - negative with and without metabolic activation.

In Vivo (Chromosome aberration; EU Method B12; mouse; intraperitoneal with up to 2250 mg/kg) - negative; the substance did not induce micronuclei in bone marrow erythrocytes of mice.

In Vivo (DNA damage and/or repair; OECD TG 486; Rat; Oral with up to 2000 mg/kg bw) - negative; it didn't induce the net nuclear grain counts in hepatocytes. Only negative results were observed from the In Vivo tests, the substance was not classified as a mutagen.

Reference: ECHA (2012).

1333-86-4 Carbon black (wetted form)

Mutagenicity negative (salmonella typhimurium) (In Vitro (Ames test))

· Potential Health Effect(s): No further relevant information; classification is not possible.

· Carcinogenicity

25068-38-6 Bisphenol-A-(epichlorohydrin) epoxy resin

Carcinogenicity negative (Test species: n/a) (Not listed by ACGIH, IARC, NTP, or OSHA)

21645-51-2 Aluminum hydroxide

Carcinogenicity negative (Human)

The substance was not regulated as a carcinogen by IARC, NTP, or OSHA. Reference: ECHA (2011).

2386-87-0 (3,4-Epoxy cyclohexyl)methyl 3,4-epoxycyclohexylcarboxylate

Carcinogenicity negative (Test species: n/a) (not listed as a Carcinogen by NTP, IARC or OSHA)

Carcinogenicity positive (rat)

(Human)

This substance is inextricably bound within a product and will not contribute to an inhalation hazard.

IARC Group 2B Possibly carcinogenic to humans. Based on inhalation studies with animals.

· Reproductive Toxicity

25068-38-6 Bisphenol-A-(epichlorohydrin) epoxy resin

Reproductive Toxi. negative (Test species: n/a) (no reproductive or developmental effect observed)

21645-51-2 Aluminum hydroxide

Reproductive Toxi. negative (rat) (OECD TG 414; oral; 10 day-treatment; twice/day)

Reference: ECHA (2011).

2386-87-0 (3,4-Epoxy cyclohexyl)methyl 3,4-epoxycyclohexylcarboxylate

Reproductive Toxi. negative (rat) (OECD TG 414; Oral with up to 500 mg/kg bw/day)

NOAEL (maternal toxicity) = 25 mg/kg bw/day; lower mean body weight, reduced mean food consumption, and increased mean kidney weight were observed.

NOAEL (developmental toxicity) = 125 mg/kg bw/day. Reduced mean fetal body weight and increased skeletal developmental variations were observed at 500 mg/kg bw/day dose level. There were no developmental effects observed at the non-maternal toxic dose levels, the substance was therefore not classified as a reproductive hazard.

Reference: ECHA (2012).

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1333-86-4 Carbon black (wetted form)

Reproductive Toxi. | negative (Test species: n/a) (Incapable of reaching reproductive organs)

· **Potential Health Effect(s):** Not a known reproductive hazard.

· **Specific Target Organ Toxicity - Single Exposure**

25068-38-6 Bisphenol-A-(epichlorohydrin) epoxy resin

STOT-Single | Target: None (Rats and Mice) (No effect after single oral doses)

21645-51-2 Aluminum hydroxide

STOT-Single | Target: None (rat) (No mortality or any adverse effect observed)

No mortality or any adverse effect was observed after a single oral administration of 2000 mg/kg to rats. Reference: ECHA (2011).

2386-87-0 (3,4-Epoxy cyclohexyl)methyl 3,4-epoxy cyclohexylcarboxylate

STOT-Single | (No data available)

1333-86-4 Carbon black (wetted form)

STOT-Single | Target: None (rat) (No effect after oral with 10000 mg/kg)

· **Potential Health Effect(s):** Not a known hazard to organs upon single exposure.

· **Specific Target Organ Toxicity - Repeated Exposure**

25068-38-6 Bisphenol-A-(epichlorohydrin) epoxy resin

STOT-Repeated | Target: N/A (guinea pig) (insufficient data for classification)

21645-51-2 Aluminum hydroxide

STOT-Repeated | Target: None (rat) (OECD TG 407; neat substance; 28 days; oral)

NOAEL (male rats) = 302 mg/kg bw/day: No mortality or any adverse effect was observed at daily doses up to 302 mg/kg body weight to rats. Reference: ECHA (2011).

2386-87-0 (3,4-Epoxy cyclohexyl)methyl 3,4-epoxy cyclohexylcarboxylate

STOT-Repeated | Target: N/a (rat) (insufficient data for classification)

1333-86-4 Carbon black (wetted form)

STOT-Repeated | Target: None (Rats and Mice) (No effect after repeated oral with 2050mg/kg/day)

· **Aspiration Hazard**

25068-38-6 Bisphenol-A-(epichlorohydrin) epoxy resin

Aspiration Hazard | (No data available)

21645-51-2 Aluminum hydroxide

Aspiration Hazard | (No data available)

2386-87-0 (3,4-Epoxy cyclohexyl)methyl 3,4-epoxy cyclohexylcarboxylate

Aspiration Hazard | (No data available)

1333-86-4 Carbon black (wetted form)

Aspiration Hazard | (No data available)

· **Potential Health Effect(s):** No relevant information; classification is not possible.

· **Additional Information** No further relevant information.

12 ECOLOGICAL INFORMATION

· **Aquatic Environmental Toxicity**

25068-38-6 Bisphenol-A-(epichlorohydrin) epoxy resin

Algae Toxicity | (No data available)

Crustacean Toxicity | 1.4 - 1.7 mg/l (Daphnia magna (water flea)) (EC50 (48 hrs))

Fish Toxicity | 1.41 mg/l (Oryzias latipes (Rice fish)) (LC50 (96 hrs))

21645-51-2 Aluminum hydroxide

Algae Toxicity | > 100 mg/l (Selenastrum capricornum) (NOEC (72 hrs); OECD TG 201)

Crustacean Toxicity (static) | > 100 mg/l (Daphnia magna (water flea)) (NOEC (48 hrs); OECD TG 202)

Fish Toxicity | > 100 mg/l (Brown trout (Salmo trutta or Sea trout)) (NOEC (96 hrs); OECD TG 203)

Reference: IUCLID Dataset (2000).

2386-87-0 (3,4-Epoxy cyclohexyl)methyl 3,4-epoxy cyclohexylcarboxylate

Algae Toxicity | 90 mg/l (Selenastrum capricornum) (EC50 (72 hrs); OECD TG 201)

Crustacean Toxicity | 40 mg/l (Daphnia magna (water flea)) (EC50 (48 hrs); OECD TG 202)

Fish Toxicity | 24 mg/l (Oncorhynchus mykiss (Rainbow trout)) (LC50 (96 hrs); OECD TG 203)

Based on the rapid degradability and the acute LC50 < 100 mg/l, the substance is classified as an Acute-3 environmental hazard.

Reference: ECHA (2012).

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1333-86-4 Carbon black (wetted form)

Algae Toxicity	>1000 mg/l (Selenastrum capricornum) (LC50 (96 hrs, suspensions))
Crustacean Toxicity	5600 - 10000 mg/l (Daphnia magna (water flea)) (EC50 (24 hrs), OECD TG 202)
Fish Toxicity	>1000 mg/l (Brachydanio rerio (Zebra fish)) (LC50 (96 hrs, suspensions))

· **Aquatic Environmental Toxicity Assessment:** No further relevant information; classification is not possible.

· **Degradability and Stability**

25068-38-6 Bisphenol-A-(epichlorohydrin) epoxy resin

Biodegradation	non-biodegrad. (Test species: n/a) (Biodegradation (OECD TG 302B; 28 days) = 12%)
Persistence	(Test species: n/a) (This substance is persistent) Reference: Canada DSL (2007) and CHRIP (2010).
Photodegradation	6.69E-11 cm ³ /molecule-sec (OH radical) (Half-life (T1/2) = 1.92 hrs) However, photolysis in water is negligible.
Stability in water	(No data available)

21645-51-2 Aluminum hydroxide

Biodegradation	non-biodegrad. (Test species: n/a) (Due to being persistent)
Persistence	(Test species: n/a) (The substance is persistent) Reference: Canada DSL (2007).
Photodegradation	(No data available)
Stability in water	(No data available)

2386-87-0 (3,4-Epoxy-cyclohexyl)methyl 3,4-epoxy-cyclohexylcarboxylate

Biodegradation	readily biodeg. (Test species: n/a) (OECD TG 301B; 4 weeks; Chemical Conc. 20 mg/l) Biodegradation = 71%; the substance is readily biodegradable. Reference: ECHA (2012).
Persistence	(Test species: n/a) (The substance is not persistent) Reference: Canada DSL (2007).
Photodegradation	(No data available)
Stability in water	Half-life=47hrs (Test species: n/a) (OECD TG 111; 20 °C; PH=7) Half-life (pH=4, 7, and 9) = 21, 47, and 42 hours respectively. Reference: ECHA (2012).

1333-86-4 Carbon black (wetted form)

Biodegradation	non-biodegrad. (Test species: n/a) (Due to being an inorganic elemental carbon)
Persistence	persistent (Test species: n/a)
Photodegradation	(Test species: n/a) (Photolysis is not expected)
Stability in water	stable (Test species: n/a) (Due to being an inorganic elemental carbon)

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· Bioaccumulation and Distribution

25068-38-6 Bisphenol-A-(epichlorohydrin) epoxy resin

LogPow	3.7 - 3.9 (Test species: n/a)
BCF	0.56-42 (Cyprinus carpio) (The substance is low-bioaccumulative)
Koc	1800 - 4400 L/kg (soil) Potential for mobility in soil is moderate.

21645-51-2 Aluminum hydroxide

LogPow	(No data available)
BCF	(Test species: n/a) (The substance is not bioaccumulative) Reference: Canada DSL (2007).
Koc	(No data available)

2386-87-0 (3,4-Epoxy cyclohexyl)methyl 3,4-epoxycyclohexylcarboxylate

LogPow	1.34 (Test species: n/a) (OECD TG 107; 20 °C) Reference: ECHA (2012).
BCF	(Test species: n/a) (The substance is not bioaccumulative) Reference: Canada DSL (2007).
Koc	26.27 L/kg (Test species: n/a) (Calculated by PCKOCWIN v1.66) Reference: ECHA (2012).

1333-86-4 Carbon black (wetted form)

LogPow	(Not applicable) (Due to being an inorganic elemental carbon)
BCF	(Test species: n/a) (The substance is not bioaccumulative) Reference: OECD SIDS (2006).
Koc	(Test species: n/a) (Primarily partitions to soil, or sediment)

· Degradability and Bioaccumulation Assessment: Non-rapidly degradable, and low bioaccumulative.

13 DISPOSAL CONSIDERATIONS

· Hazardous Waste List

· Description: It may be necessary to contain and dispose of the substance/mixture as a hazardous waste.

· RCRA Waste:

1330-20-7	Xylene	U239	0.1-1%
100-41-4	Ethylbenzene	D001	0- <0.1%
108-88-3	Toluene	U220	0- <0.1%

· Waste Treatment Recommendation:

Generation of waste should be avoided or minimized wherever possible.

Chemical waste, even small quantities, is neither allowed to be poured down drains, sewage system or waterways; nor disposed with household garbage.

Dispose of contents/containers in accordance with local, regional, national, and international regulations.

· Unused and Uncontaminated Packagings

· Recommendation Dispose of according to your local waste regulations.

14 TRANSPORT INFORMATION

· UN-Number

· DOT	Not Regulated
· ADR, IMDG, IATA	UN3082

· UN Proper Shipping Name

· DOT	Not Regulated
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· IMDG

ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID,
N.O.S. (Bisphenol-A-(epichlorohydrin) epoxy resin), MARINE POLLUTANT

· IATA

ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID,
N.O.S. (Bisphenol-A-(epichlorohydrin) epoxy resin)


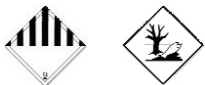
· Transport hazard class(es)

· DOT	
· Class	Not Regulated

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Trade Name: Kronos-10™

· ADR		
· Class		9 (M6) Miscellaneous dangerous substances and articles
· Label		9
<hr/>		
· IMDG, IATA		
· Class		9 Miscellaneous dangerous substances and articles
· Label		9
· Packing group		
· DOT		Not Regulated
· ADR, IMDG, IATA		III
· Environmental Hazards:		Product contains environmentally hazardous substances: Bisphenol-A-(epichlorohydrin) epoxy resin
· Marine Pollutant:		Yes (DOT)
		Symbol (fish and tree)
· Special Marking (ADR):		Symbol (fish and tree)
· Special Marking (IATA):		Symbol (fish and tree)
· Special Precautions:		Warning: Miscellaneous dangerous substances and articles
· Danger Code (Kemler):		90
· EMS Number:		F-A,S-F
· Stowage Category		A
· Transport in Bulk according to Annex II of MARPOL73/78		
· IBC Code		Not applicable.
· Transport/Additional Information:		
· ADR		
· Excepted quantities (EQ)		Code: E1 Maximum net quantity per inner packaging: 30 ml Maximum net quantity per outer packaging: 1000 ml
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· IMDG		
· Limited quantities (LQ)		5L
· Excepted quantities (EQ)		Code: E1 Maximum net quantity per inner packaging: 30 ml Maximum net quantity per outer packaging: 1000 ml
· UN "Model Regulation":		UN 3082 ENVIRONMENTALLY HAZARDOUS SUBSTANCES, LIQUID, N.O.S. (BISPHENOL-A-(EPICHLOROHYDRIN) EPOXY RESIN), 9, III

15 REGULATORY INFORMATION

· USA Regulation Lists

- **SARA (Superfund Amendments and Reauthorization Act of 1986)**
- **Section 302 (Extremely Hazardous Substances)**

None of the ingredients is listed.

· Section 313 (Toxics Release Inventory (TRI) reporting)

1330-20-7	Xylene	0.1-1%
100-41-4	Ethylbenzene	0- <0.1%
108-88-3	Toluene	0- <0.1%

· Section 311/312 (Hazardous Chemical Inventory Reporting)

25068-38-6	Bisphenol-A-(epichlorohydrin) epoxy resin	A, C	25-30%
2530-83-8	Glycidyloxypropyltrimethoxysilane	A, C	0.1- <1%
1330-20-7	Xylene	A, C, F	0.1-1%
1333-86-4	Carbon black (wetted form)	A, C	0.1-0.5%
108-88-3	Toluene	A, C, F	0- <0.1%

· Hazard Abbreviations for SARA 311/312

- A - Acute Health Hazard
- C - Chronic Health Hazard
- F - Fire Hazard
- R - Reactive Hazard
- S - Sudden Release of Pressure Hazard

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• **TSCA (Toxic Substances Control Act)**

All ingredients are listed.

• **Proposition 65**

• **Chemicals Known to Cause Cancer**

100-41-4	Ethylbenzene
122-60-1	Phenyl glycidyl ether

• **Chemicals Known to Cause Reproductive Toxicity for Females**

None of the ingredients is listed.

• **Chemicals Known to Cause Reproductive Toxicity for Males**

None of the ingredients is listed.

• **Chemicals Known to Cause Developmental Toxicity**

108-88-3	Toluene
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• **Carcinogenic Categories**

• **EPA (Environmental Protection Agency)**

1330-20-7	Xylene	I
100-41-4	Ethylbenzene	D
108-88-3	Toluene	D

• **IARC (International Agency for Research on Cancer)**

60676-86-0	Silica, fused	3
1330-20-7	Xylene	3
1333-86-4	Carbon black ((wetted form) the substance is inextricably bound in the product and does not contribute to a dust inhalation hazard).	2B
100-41-4	Ethylbenzene	2B
108-88-3	Toluene	3

• **NTP (National Toxicology Program)**

None of the ingredients is listed.

• **TLV (Threshold Limit Value Established by ACGIH)**

1330-20-7	Xylene	A4
1333-86-4	Carbon black (wetted form)	A4
100-41-4	Ethylbenzene	A3
108-88-3	Toluene	A4

• **NIOSH-Ca (National Institute for Occupational Safety and Health)**

60676-86-0	Silica, fused
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• **International Regulation Lists**

• **Chinese Chemical Inventory of Existing Chemical Substances:**

All ingredients are listed.

• **Japanese Existing and New Chemical Substance List:**

All ingredients are listed.

• **Korean Existing Chemical Inventory:**

All ingredients are listed.

• **European Pre-registered substances:**

All ingredients are listed.

• **REACH - Substances of Very High Concern (SVHC) List:**

19438-60-9	hexahydro-4-methylphthalic anhydride	30-40%
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• **Restriction of Hazardous Substances Directive (RoHS) list:**

None of the ingredients is listed.

Trade Name: Kronos-10™

16 OTHER INFORMATION

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

· **Department Issuing (M)SDS:** Product Safety Department

· **Contact:** msds@plasmarugged.com

· Abbreviations and acronyms:

ACGIH: American Conference of Governmental Industrial Hygienists

ACToR: US EPA Aggregated Computational Toxicology Resource

ADR: European Agreement Concerning the International Carriage of Dangerous Goods by Road

BCF: Bioconcentration Factor

CAS: Chemical Abstracts Service (division of the American Chemical Society)

CCRIS: US NLM TOXNET Chemical Carcinogenesis Research Information System

CHRIP: Japan NITE Information on Biodegradation and Bioconcentration of the Existing Chemical Substances in the Chemical Risk Information Platform

DOT: US Department of Transportation

DSL: Canada Domestic Substance List

ESIS: European Chemical Substances Information System

HMIS: US National Paint & Coatings Association (NPCA) Hazardous Materials Identification System

HSDB: US NLM TOXNET Hazardous Substances Databank

HSNO CCID: New Zealand Hazardous Substances and New Organisms Chemical Classification Information Database

IARC: International Agency for Research on Cancer developed by United Nations World Health Organisation (WHO)

IATA-DGR: Dangerous Goods Regulations (DGR) by the International Air Transport Association (IATA)

ICAO-TI: Technical Instructions (TI) by the International Civil Aviation Organization (ICAO)

ICSC: International Chemical Safety Cards

IMDG: International Maritime Dangerous Goods; the principal international rules for International Carriage of Dangerous Goods by SEA under the Recommendations on the Transport of Dangerous Goods by United Nations (RTDG)

Koc: Partition coefficient, soil Organic Carbon to water

LC50/LD50: Lethal Concentration/Dose, 50 percent

N/a: Not available or Not applicable

NFPA: US National Fire Protection Association

NIOSH: US National Institute of Occupational Safety and Health

NITE: National Institute of Technology and Evaluation, Japan

OECD: Organisation for Economic Co-operation and Development

OSHA: US Occupational Safety and Health Administration

P: Marine Pollutant

RCRA: Resource Conservation and Recovery Act (USA)

REACH: EU Registry, Evaluation and Authorisation of Chemicals

RID: the Regulations Concerning the International Carriage of Dangerous Goods by Rail; published by the Central Office for International Carriage by Rail (OTIF)

RTDG: the Recommendations on the Transport of Dangerous Goods by United Nations (UN)

RTECS: US Registry of Toxic Effects of Chemical Substances

SARA: US Superfund Amendments and Reauthorization Act

SIDS: OECD existing chemicals Screening Information Data Sets

SVHC: EU ECHA Substance of Very High Concern

TEEL: Temporary Emergency Exposure Limit developed by US Subcommittee on Consequence Assessment and Protective Actions (SCAPA) of US Department of Energy (DOE)

TOXLINE: US NLM bibliographic database search system

TSCA: US Toxic Substance Control Act

· **Date of preparation / last revision** 01/13/2017 / 2