



SAFETY DATA SHEET

**DDP SPECIALTY ELECTRONIC MATERIALS US,
INC.**

Product name: BETAMATE™ 1022DUS Epoxy Adhesive

Issue Date: 10/15/2018

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DDP SPECIALTY ELECTRONIC MATERIALS US, INC. encourages and expects you to read and understand the entire (M)SDS, as there is important information throughout the document. We expect you to follow the precautions identified in this document unless your use conditions would necessitate other appropriate methods or actions.

1. IDENTIFICATION

Product name: BETAMATE™ 1022DUS Epoxy Adhesive

Recommended use of the chemical and restrictions on use

Identified uses: An adhesive -- For use in automotive applications.

COMPANY IDENTIFICATION

DDP SPECIALTY ELECTRONIC MATERIALS US,
INC.

EMERGENCY TELEPHONE NUMBER

24-Hour Emergency Contact: 1-800-424-9300

Local Emergency Contact: 800-424-9300

2. HAZARDS IDENTIFICATION

Hazard classification

This material is hazardous under the criteria of the Federal OSHA Hazard Communication Standard 29CFR 1910.1200.

Skin irritation - Category 2

Eye irritation - Category 2A

Skin sensitisation - Category 1

Reproductive toxicity - Category 2

Label elements

Hazard pictograms



Signal word: **WARNING!**

Hazards

Causes skin irritation.

May cause an allergic skin reaction.

Causes serious eye irritation.

Suspected of damaging fertility or the unborn child.

Precautionary statements**Prevention**

Obtain special instructions before use.

Do not handle until all safety precautions have been read and understood.

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

Wash skin thoroughly after handling.

Contaminated work clothing should not be allowed out of the workplace.

Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response

IF ON SKIN: Wash with plenty of soap and water.

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

IF exposed or concerned: Get medical advice/ attention.

If skin irritation or rash occurs: Get medical advice/ attention.

If eye irritation persists: Get medical advice/ attention.

Take off contaminated clothing and wash before reuse.

Storage

Store locked up.

Disposal

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

Other hazards

No data available

3. COMPOSITION/INFORMATION ON INGREDIENTS

This product is a mixture.

Component	CASRN	Concentration
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Propane, 2,2-bis[p-(2,3-epoxypropoxy)phenyl]-, polymers	25085-99-8	> 30.0 - < 40.0 %
Limestone	1317-65-3	> 10.0 - < 20.0 %
2-Propenenitrile, polymer with 1,3-butadiene, carboxy-terminated, polymers with bisphenol A and epichlorohydrin	68610-41-3	> 5.0 - < 15.0 %
POLYURETHANE ADDUCT P99-0151	Not available	> 5.0 - < 15.0 %
Polypropylene glycol diepoxide resin	26142-30-3	< 10.0 %
Wollastonite (8Cl)	13983-17-0	< 10.0 %
Calcium oxide	1305-78-8	< 10.0 %
Talc	14807-96-6	< 10.0 %
1-Cyanoguanidine	461-58-5	< 10.0 %
Dimethyl siloxane, reaction product with silica	67762-90-7	< 5.0 %
Bisphenol A	80-05-7	< 3.0 %
Carbon black	1333-86-4	< 1.0 %
N,N-Dimethyl-N'-phenylurea	101-42-8	< 1.0 %

4. FIRST AID MEASURES

Description of first aid measures

General advice:

First Aid responders should pay attention to self-protection and use the recommended protective clothing (chemical resistant gloves, splash protection). If potential for exposure exists refer to Section 8 for specific personal protective equipment.

Inhalation: Move person to fresh air; if effects occur, consult a physician.

Skin contact: Remove material from skin immediately by washing with soap and plenty of water. Remove contaminated clothing and shoes while washing. Seek medical attention if irritation persists. Wash clothing before reuse. Discard items which cannot be decontaminated, including leather articles such as shoes, belts and watchbands.

Eye contact: Flush eyes thoroughly with water for several minutes. Remove contact lenses after the initial 1-2 minutes and continue flushing for several additional minutes. If effects occur, consult a

physician, preferably an ophthalmologist. Suitable emergency eye wash facility should be available in work area.

Ingestion: If swallowed, seek medical attention. Do not induce vomiting unless directed to do so by medical personnel.

Most important symptoms and effects, both acute and delayed: Aside from the information found under Description of first aid measures (above) and Indication of immediate medical attention and special treatment needed (below), any additional important symptoms and effects are described in Section 11: Toxicology Information.

Indication of any immediate medical attention and special treatment needed

Notes to physician: No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

5. FIREFIGHTING MEASURES

Suitable extinguishing media: Water fog or fine spray. Dry chemical fire extinguishers. Carbon dioxide fire extinguishers. Foam. Alcohol resistant foams (ATC type) are preferred. General purpose synthetic foams (including AFFF) or protein foams may function, but will be less effective. Water fog, applied gently may be used as a blanket for fire extinguishment.

Unsuitable extinguishing media: Do not use direct water stream. May spread fire.

Special hazards arising from the substance or mixture

Hazardous combustion products: During a fire, smoke may contain the original material in addition to combustion products of varying composition which may be toxic and/or irritating. Combustion products may include and are not limited to: Nitrogen oxides. Carbon monoxide. Carbon dioxide.

Unusual Fire and Explosion Hazards: Container may vent and/or rupture due to fire. Violent steam generation or eruption may occur upon application of direct water stream to hot liquids. Dense smoke is produced when product burns.

Advice for firefighters

Fire Fighting Procedures: Keep people away. Isolate fire and deny unnecessary entry. Use water spray to cool fire exposed containers and fire affected zone until fire is out and danger of reignition has passed. Fight fire from protected location or safe distance. Consider the use of unmanned hose holders or monitor nozzles. Do not use direct water stream. May spread fire. Burning liquids may be moved by flushing with water to protect personnel and minimize property damage. Water fog, applied gently may be used as a blanket for fire extinguishment. Contain fire water run-off if possible. Fire water run-off, if not contained, may cause environmental damage. Review the "Accidental Release Measures" and the "Ecological Information" sections of this (M)SDS.

Special protective equipment for firefighters: Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots, and gloves). Avoid contact with this material during fire fighting operations. If contact is likely, change to full chemical resistant fire fighting clothing with self-contained breathing apparatus. If this is not available, wear full chemical resistant clothing with self-contained breathing apparatus and fight fire from a remote location. For protective equipment in post-fire or non-fire clean-up situations, refer to the relevant sections.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures: Isolate area. Keep unnecessary and unprotected personnel from entering the area. Refer to section 7, Handling, for additional precautionary measures. See Section 10 for more specific information. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.

Environmental precautions: Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information.

Methods and materials for containment and cleaning up: Contain spilled material if possible. Absorb with materials such as: Cat litter. Sand. Sawdust. Collect in suitable and properly labeled containers. See Section 13, Disposal Considerations, for additional information.

7. HANDLING AND STORAGE

Precautions for safe handling: Avoid contact with eyes, skin, and clothing. Avoid prolonged or repeated contact with skin. Wash thoroughly after handling. See Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION.

Conditions for safe storage: Avoid contact with air (oxygen). See Section 10 for more specific information.

Storage stability

Storage temperature:

> 5 - < 35 °C (> 41 - < 95 °F)

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

If exposure limits exist, they are listed below. If no exposure limits are displayed, then no values are applicable.

Component	Regulation	Type of listing	Value/Notation
Propane, 2,2-bis[p-(2,3-epoxypropoxy)phenyl]-, polymers	Dow IHG	TWA	10 mg/m3
Bisphenol A	Dow IHG	TWA Inhalable fraction and vapor	2 mg/m3

Although some of the components of this product may have exposure guidelines, no exposure would be expected under normal handling conditions due to the physical state of the material.

Exposure controls

Engineering controls: Use local exhaust ventilation, or other engineering controls to maintain airborne levels below exposure limit requirements or guidelines. If there are no applicable exposure

limit requirements or guidelines, general ventilation should be sufficient for most operations. Local exhaust ventilation may be necessary for some operations.

Individual protection measures

Eye/face protection: Use safety glasses (with side shields).

Skin protection

Hand protection: Use gloves chemically resistant to this material. Examples of preferred glove barrier materials include: Butyl rubber. Ethyl vinyl alcohol laminate ("EVAL"). Nitrile/butadiene rubber ("nitrile" or "NBR"). Neoprene. Polyvinyl chloride ("PVC" or "vinyl"). NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.

Other protection: Use protective clothing chemically resistant to this material. Selection of specific items such as face shield, boots, apron, or full body suit will depend on the task.

Respiratory protection: Respiratory protection should be worn when there is a potential to exceed the exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, wear respiratory protection when adverse effects, such as respiratory irritation or discomfort have been experienced, or where indicated by your risk assessment process. For most conditions, no respiratory protection should be needed; however, if handling at elevated temperatures without sufficient ventilation, use an approved air-purifying respirator.

The following should be effective types of air-purifying respirators: Organic vapor cartridge.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Physical state	Paste
Color	Black
Odor	Mild
Odor Threshold	No test data available
pH	No test data available
Melting point/range	No test data available
Freezing point	No test data available
Boiling point (760 mmHg)	No test data available
Flash point	closed cup > 110.00 °C (> 230.00 °F) <i>Pensky-Martens</i> <i>Closed Cup ASTM D 93</i>
Evaporation Rate (Butyl Acetate = 1)	No test data available
Flammability (solid, gas)	The product is not flammable.
Lower explosion limit	No test data available
Upper explosion limit	No test data available
Vapor Pressure	No test data available

Relative Vapor Density (air = 1)	No test data available
Relative Density (water = 1)	1.389 <i>ASTM D1475</i>
Water solubility	No test data available
Partition coefficient: n-octanol/water	No data available
Auto-ignition temperature	No test data available
Decomposition temperature	No data available
Kinematic Viscosity	No test data available
Explosive properties	No test data available
Oxidizing properties	No test data available
Molecular weight	No data available
Volatile Organic Compounds	0.04 lb/gln <i>EPA Method No. 24</i> (typical value)

NOTE: The physical data presented above are typical values and should not be construed as a specification.

10. STABILITY AND REACTIVITY

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

Chemical stability: Stable under recommended storage conditions. See Storage, Section 7. Unstable at elevated temperatures.

Possibility of hazardous reactions: Can occur. Elevated temperatures can cause hazardous polymerization.

Conditions to avoid: Avoid contact with air (oxygen). Avoid temperatures above 200°C (392°F). Exposure to elevated temperatures can cause product to decompose.

Incompatible materials: Avoid contact with: Acids. Amines. Bases. Strong oxidizers.

Hazardous decomposition products: Decomposition products depend upon temperature, air supply and the presence of other materials.

11. TOXICOLOGICAL INFORMATION

Toxicological information appears in this section when such data is available.

Acute toxicity

Acute oral toxicity

Low toxicity if swallowed. Small amounts swallowed incidentally as a result of normal handling operations are not likely to cause injury; however, swallowing larger amounts may cause injury.

Single dose oral LD50 has not been determined.

Acute dermal toxicity

Prolonged skin contact is unlikely to result in absorption of harmful amounts.

The dermal LD50 has not been determined.

Acute inhalation toxicity

At room temperature, exposure to vapor is minimal due to low volatility; vapor from heated material may cause respiratory irritation. This material contains mineral and/or inorganic fillers. There is essentially no potential for inhalation exposure to these fillers incidental to industrial handling due to the physical state.

As product: The LC50 has not been determined.

Skin corrosion/irritation

Prolonged contact may cause skin irritation with local redness.

Material may stick to skin causing irritation upon removal.

Serious eye damage/eye irritation

May cause eye irritation.

Sensitization

For skin sensitization:

A component in this mixture has caused allergic skin reactions in humans.

For respiratory sensitization:

No relevant data found.

Specific Target Organ Systemic Toxicity (Single Exposure)

Evaluation of available data suggests that this material is not an STOT-SE toxicant.

Specific Target Organ Systemic Toxicity (Repeated Exposure)

Liver effects and questionable kidney and bladder effects were observed in animals fed bisphenol A.

Contains component(s) which have been reported to cause effects on the following organs in animals:
Kidney.

Carcinogenicity

Many studies have been conducted to assess the potential carcinogenicity of diglycidyl ether of bisphenol A (DGEBA). Indeed, the most recent review of the available data by the International Agency for Research on Cancer (IARC) has concluded that DGEBA is not classified as a carcinogen. Although some weak evidence of carcinogenicity has been reported in animals, when all of the data are considered, the weight of evidence does not show that DGEBA is carcinogenic.

Teratogenicity

Contains component(s) which did not cause birth defects in animals; other fetal effects occurred only at doses toxic to the mother. Resins based on the diglycidyl ether of bisphenol A (DGEBA) did not cause birth defects or other adverse effects on the fetus when pregnant rabbits were exposed by skin contact, the most likely route of exposure, or when pregnant rats or rabbits were exposed orally.

Contains component(s) which caused birth defects in laboratory animals.

Reproductive toxicity

Bisphenol A affected reproduction in rats and mice, but only at high exposure levels that exceeded the body's capacity to metabolize and deactivate the chemical. Maintaining exposures below appropriate workplace exposure limits should avoid these and other effects.

Mutagenicity

Contains component(s) which were negative in some in vitro genetic toxicity studies and positive in others. Contains component(s) which were negative in animal genetic toxicity studies.

Aspiration Hazard

Based on physical properties, not likely to be an aspiration hazard.

COMPONENTS INFLUENCING TOXICOLOGY:**Propane, 2,2-bis[p-(2,3-epoxypropoxy)phenyl]-, polymers****Acute oral toxicity**

LD50, Rat, > 15,000 mg/kg

Acute dermal toxicity

LD50, Rabbit, 23,000 mg/kg

Acute inhalation toxicity

The LC50 has not been determined.

Limestone**Acute oral toxicity**

LD50, Rat, > 6,000 mg/kg

Acute dermal toxicity

LD50, Rat, > 2,000 mg/kg No deaths occurred at this concentration.

Acute inhalation toxicity

LC50, Rat, 4 Hour, dust/mist, > 3 mg/l The LC50 value is greater than the Maximum Attainable Concentration. No deaths occurred at this concentration.

2-Propenenitrile, polymer with 1,3-butadiene, carboxy-terminated, polymers with bisphenol A and epichlorohydrin**Acute oral toxicity**

Single dose oral LD50 has not been determined.

Acute dermal toxicity

The dermal LD50 has not been determined.

Acute inhalation toxicity

The LC50 has not been determined.

POLYURETHANE ADDUCT P99-0151**Acute oral toxicity**

Single dose oral LD50 has not been determined.

Acute dermal toxicity

The dermal LD50 has not been determined.

Acute inhalation toxicity

The LC50 has not been determined.

Polypropylene glycol diepoxide resin**Acute oral toxicity**

LD50, Rat, > 2,000 mg/kg OECD Test Guideline 401 No deaths occurred at this concentration.

Acute dermal toxicity

LD50, Rat, male and female, > 2,000 mg/kg OECD Test Guideline 402 No deaths occurred at this concentration.

Acute inhalation toxicity

The LC50 has not been determined.

Wollastonite (8CI)**Acute oral toxicity**

Single dose oral LD50 has not been determined.

Acute dermal toxicity

The dermal LD50 has not been determined.

Acute inhalation toxicity

The LC50 has not been determined.

Calcium oxide**Acute oral toxicity**

LD50, Rat, female, > 2,000 mg/kg OECD Test Guideline 425 No deaths occurred at this concentration.

Acute dermal toxicity

For similar material(s): LD50, Rat, male and female, > 2,500 mg/kg No deaths occurred at this concentration.

Acute inhalation toxicity

The LC50 has not been determined.

Talc**Acute oral toxicity**

Single dose oral LD50 has not been determined.

Acute dermal toxicity

The dermal LD50 has not been determined.

Acute inhalation toxicity

The LC50 has not been determined.

1-Cyanoguanidine**Acute oral toxicity**

LD50, Rat, > 10,000 mg/kg

Acute dermal toxicity

LD50, Rabbit, > 10,000 mg/kg

Acute inhalation toxicity

The LC50 has not been determined.

Dimethyl siloxane, reaction product with silica**Acute oral toxicity**

LD50, Rat, > 5,000 mg/kg OECD 401 or equivalent No deaths occurred at this concentration.

Acute dermal toxicity

LD50, Rat, > 2,000 mg/kg OECD Test Guideline 402

Acute inhalation toxicity

For similar material(s): LC50, Rat, 4 Hour, dust/mist, > 0.477 mg/l

Bisphenol A**Acute oral toxicity**

LD50, Rat, male and female, > 2,000 mg/kg

Acute dermal toxicity

LD50, Rabbit, 3,000 mg/kg

Acute inhalation toxicity

The LC50 has not been determined.

Carbon black**Acute oral toxicity**

LD50, Rat, > 8,000 mg/kg

Acute dermal toxicity

LD50, Rabbit, > 3,000 mg/kg No deaths occurred at this concentration.

Acute inhalation toxicity

LC50, Rat, 1 Hour, dust/mist, 27 mg/l No deaths occurred at this concentration.

N,N-Dimethyl-N'-phenylurea**Acute oral toxicity**

LD50, Rat, 6,400 mg/kg

Acute dermal toxicity

LD50, Rabbit, 4,700 mg/kg

Acute inhalation toxicity

The LC50 has not been determined.

12. ECOLOGICAL INFORMATION

Ecotoxicological information appears in this section when such data is available.

Toxicity**Propane, 2,2-bis[p-(2,3-epoxypropoxy)phenyl]-, polymers****Acute toxicity to fish**

Material is moderately toxic to aquatic organisms on an acute basis (LC50/EC50 between 1 and 10 mg/L in the most sensitive species tested).

LC50, Oncorhynchus mykiss (rainbow trout), semi-static test, 96 Hour, 2 mg/l

Acute toxicity to aquatic invertebrates

EC50, Daphnia magna (Water flea), static test, 48 Hour, 1.8 mg/l

Acute toxicity to algae/aquatic plants

ErC50, Scenedesmus capricornutum (fresh water algae), static test, 72 Hour, Growth rate inhibition, 11 mg/l

Toxicity to bacteria

IC50, Bacteria, 18 Hour, Respiration rates., > 42.6 mg/l

Chronic toxicity to aquatic invertebrates

NOEC, Daphnia magna (Water flea), semi-static test, 21 d, number of offspring, 0.3 mg/l

Limestone

Acute toxicity to fish

Material is practically non-toxic to fish on an acute basis (LC50 > 100 mg/L).

LC50, Gambusia affinis (Mosquito fish), static test, 96 Hour, > 56,000 mg/l

2-Propenenitrile, polymer with 1,3-butadiene, carboxy-terminated, polymers with bisphenol A and epichlorohydrin

Acute toxicity to fish

No relevant data found.

POLYURETHANE ADDUCT P99-0151

Acute toxicity to fish

Not expected to be acutely toxic to aquatic organisms.

Polypropylene glycol diepoxide resin

Acute toxicity to fish

Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).

LC50, Leuciscus idus (Golden orfe), 96 Hour, 160 mg/l

Acute toxicity to aquatic invertebrates

EC50, Daphnia magna (Water flea), 48 Hour, 220 mg/l

Wollastonite (8CI)

Acute toxicity to fish

Not expected to be acutely toxic to aquatic organisms.

Calcium oxide

Acute toxicity to fish

May increase pH of aquatic systems to > pH 10 which may be toxic to aquatic organisms.

Material is not classified as dangerous to aquatic organisms (LC50/EC50/IC50/LL50/EL50 greater than 100 mg/L in most sensitive species).

LC50, Cyprinus carpio (Carp), static test, 96 Hour, 1,070 mg/l

Acute toxicity to aquatic invertebrates

Based on data from similar materials

LC50, 96 Hour, 158 mg/l

Acute toxicity to algae/aquatic plants

Based on data from similar materials

EC50, Pseudokirchneriella subcapitata (green algae), 72 Hour, 184.57 mg/l, OECD Test Guideline 201

Based on data from similar materials

NOEC, Pseudokirchneriella subcapitata (green algae), 72 Hour, 48 mg/l, OECD Test Guideline 201

Toxicity to bacteria

Based on data from similar materials

EC50, 3 Hour, 300.4 mg/l, OECD Test Guideline 209

Chronic toxicity to aquatic invertebrates

Based on data from similar materials

NOEC, 12 d, 32 mg/l

Talc**Acute toxicity to fish**

Material is practically non-toxic to fish on an acute basis (LC50 > 100 mg/L).

LC50, Danio rerio (zebra fish), 24 Hour, > 100,000 mg/l, Method Not Specified.

1-Cyanoguanidine**Acute toxicity to fish**

Material is practically non-toxic to fish on an acute basis (LC50 > 100 mg/L).

LC50, Oryzias latipes (Orange-red killifish), 48 Hour, > 1,000 mg/l, OECD Test Guideline 203 or Equivalent

Acute toxicity to aquatic invertebrates

EC50, Daphnia magna (Water flea), 48 Hour, > 1,000 mg/l, OECD Test Guideline 202 or Equivalent

Acute toxicity to algae/aquatic plants

ErC50, alga Scenedesmus sp., 72 Hour, Growth rate inhibition, > 1,000 mg/l, OECD Test Guideline 201 or Equivalent

Toxicity to bacteria

EC50, Nitrosomonas sp., 28 d, > 100 mg/l

Chronic toxicity to fish

NOEC, 14 d, survival, > 100 mg/l

Chronic toxicity to aquatic invertebrates

NOEC, Daphnia magna (Water flea), 21 d, number of offspring, 25 mg/l

Dimethyl siloxane, reaction product with silica**Acute toxicity to fish**

Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).

LC50, zebra fish (Brachydanio rerio), 96 Hour, > 1,000 mg/l, OECD Test Guideline 203

Acute toxicity to aquatic invertebrates

EC50, Daphnia magna (Water flea), 24 Hour, > 1,000 mg/l, OECD Test Guideline 202

Bisphenol A

Acute toxicity to fish

Material is moderately toxic to aquatic organisms on an acute basis (LC50/EC50 between 1 and 10 mg/L in the most sensitive species tested).

LC50, Fathead minnow (Pimephales promelas), 96 Hour, 4.6 mg/l

LC50, Atlantic silverside (Menidia menidia), 96 Hour, 9.4 mg/l

Acute toxicity to aquatic invertebrates

EC50, Daphnia magna (Water flea), 48 Hour, 10.2 mg/l

EC50, saltwater mysid Mysidopsis bahia, 96 Hour, 1.1 mg/l

Acute toxicity to algae/aquatic plants

EC50, Skeletonema costatum (marine diatom), static test, 96 Hour, Growth rate inhibition, 1.1 mg/l

Toxicity to bacteria

EC50, Bacteria, 96 Hour, Respiration rates., > 320 mg/l

Chronic toxicity to fish

NOEC, Fathead minnow (Pimephales promelas), 164 d, mortality, 0.160 mg/l

NOEC, Pimephales promelas (fathead minnow), 444 d, number of offspring, 0.016 mg/l

NOEC, Cyprinodon variegatus (sheepshead minnow), 116 d, number of offspring, 0.066 mg/l

Chronic toxicity to aquatic invertebrates

NOEC, saltwater mysid Mysidopsis bahia, 28 d, number of offspring, 0.17 mg/l

NOEC, Marisa cornuarietis (Giant Ramshorn Snail), 328 d, growth, 0.025 mg/l

Carbon black

Acute toxicity to fish

Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).

LC50, Leuciscus idus (Golden orfe), static test, 96 Hour, > 1,000 mg/l, OECD Test Guideline 203 or Equivalent

Acute toxicity to aquatic invertebrates

EC50, Daphnia magna (Water flea), 24 Hour, > 5,600 mg/l, OECD Test Guideline 202 or Equivalent

Acute toxicity to algae/aquatic plants

NOEC, Desmodesmus subspicatus (green algae), 72 Hour, 10,000 mg/l, OECD Test Guideline 201

N,N-Dimethyl-N'-phenylurea

Acute toxicity to fish

Material is moderately toxic to aquatic organisms on an acute basis (LC50/EC50 between 1 and 10 mg/L in the most sensitive species tested).

LC50, Oncorhynchus mykiss (rainbow trout), 96 Hour, 204 mg/l, Method Not Specified.

LC50, Poecilia reticulata (guppy), 96 Hour, 610 mg/l

Acute toxicity to algae/aquatic plants

EC50, Algae, 36 Hour, 1 - 10 mg/l, Method Not Specified.

EC50, Algae, 10 d, < 2.9 mg/l, Method Not Specified.

Persistence and degradability

Propane, 2,2-bis[p-(2,3-epoxypropoxy)phenyl]-, polymers

Biodegradability: Substance exhibits potential to biodegrade in the environment, but has not passed OECD/EEC tests for ready biodegradability.

10-day Window: Not applicable

Biodegradation: 12 %

Exposure time: 28 d

Method: OECD Test Guideline 302B or Equivalent

Theoretical Oxygen Demand: 2.35 mg/mg Estimated.

Photodegradation

Test Type: Half-life (indirect photolysis)

Sensitization: OH radicals

Atmospheric half-life: 1.92 Hour

Method: Estimated.

Limestone

Biodegradability: Biodegradation is not applicable.

2-Propenenitrile, polymer with 1,3-butadiene, carboxy-terminated, polymers with bisphenol A and epichlorohydrin

Biodegradability: No relevant data found.

POLYURETHANE ADDUCT P99-0151

Biodegradability: Biodegradation is not applicable. Surface photodegradation is expected with exposure to sunlight.

Polypropylene glycol diepoxide resin

Biodegradability: Based on stringent OECD test guidelines, this material cannot be considered as readily biodegradable; however, these results do not necessarily mean that the material is not biodegradable under environmental conditions.

10-day Window: Fail

Biodegradation: 14 - 21 %

Exposure time: 28 d

Method: OECD Test Guideline 301B or Equivalent

Wollastonite (8Cl)

Biodegradability: Biodegradation is not applicable.

Calcium oxide

Biodegradability: Biodegradation is not applicable.

Theoretical Oxygen Demand: 0.0 mg/mg

Talc

Biodegradability: Biodegradation is not applicable.

1-Cyanoquanidine

Biodegradability: Based on stringent OECD test guidelines, this material cannot be considered as readily biodegradable; however, these results do not necessarily mean that the material is not biodegradable under environmental conditions.

10-day Window: Not applicable

Biodegradation: 2.2 %

Exposure time: 14 d

Method: OECD Test Guideline 302C or Equivalent

Theoretical Oxygen Demand: 3.04 mg/mg

Photodegradation

Atmospheric half-life: 0.255 d

Method: Estimated.

Dimethyl siloxane, reaction product with silica

Biodegradability: Biodegradation is not applicable.

Bisphenol A

Biodegradability: Material is readily biodegradable. Passes OECD test(s) for ready biodegradability.

10-day Window: Pass

Biodegradation: 93.1 %

Exposure time: 28 d

Method: OECD Test Guideline 301F or Equivalent

10-day Window: Not applicable

Biodegradation: 87 - 95 %

Exposure time: 28 d

Method: OECD Test Guideline 302A or Equivalent

Theoretical Oxygen Demand: 2.52 mg/mg

Photodegradation

Test Type: Half-life (direct photolysis)

Method: Measured

Carbon black

Biodegradability: Biodegradation is not applicable.

N,N-Dimethyl-N'-phenylurea

Biodegradability: No relevant information found.

Photodegradation

Sensitization: OH radicals

Atmospheric half-life: 0.236 d

Method: Estimated.

Bioaccumulative potential**Propane, 2,2-bis[p-(2,3-epoxypropoxy)phenyl]-, polymers**

Bioaccumulation: Bioconcentration potential is moderate (BCF between 100 and 3000 or Log Pow between 3 and 5).

Partition coefficient: n-octanol/water(log Pow): 3.242 at 25 °C Estimated.

Limestone

Bioaccumulation: Partitioning from water to n-octanol is not applicable.

2-Propenenitrile, polymer with 1,3-butadiene, carboxy-terminated, polymers with bisphenol A and epichlorohydrin

Bioaccumulation: No relevant data found.

POLYURETHANE ADDUCT P99-0151

Bioaccumulation: No bioconcentration is expected because of the relatively high molecular weight (MW greater than 1000). No relevant data found.

Polypropylene glycol diepoxide resin

Bioaccumulation: No relevant data found.

Wollastonite (8Cl)

Bioaccumulation: Partitioning from water to n-octanol is not applicable.

Calcium oxide

Bioaccumulation: Partitioning from water to n-octanol is not applicable.

Talc

Bioaccumulation: Partitioning from water to n-octanol is not applicable.

Bioconcentration factor (BCF): 3 Estimated.

1-Cyanoguanidine

Bioaccumulation: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).

Partition coefficient: n-octanol/water(log Pow): -0.52 at 25 °C OECD Test Guideline 107 or Equivalent

Bioconcentration factor (BCF): < 3.1 Fish Measured

Dimethyl siloxane, reaction product with silica

Bioaccumulation: Partitioning from water to n-octanol is not applicable.

Bisphenol A

Bioaccumulation: Bioconcentration potential is low (BCF less than 100 or log Pow greater than 7).

Partition coefficient: n-octanol/water(log Pow): 3.4 at 21.5 °C OECD Test Guideline 107 or Equivalent

Bioconcentration factor (BCF): 5.1 - 13.3 Cyprinus carpio (Carp) 42 d

Carbon black

Bioaccumulation: No relevant data found.

N,N-Dimethyl-N'-phenylurea

Bioaccumulation: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).

Partition coefficient: n-octanol/water(log Pow): 1.38 Estimated.

Mobility in soil**Propane, 2,2-bis[p-(2,3-epoxypropoxy)phenyl]-, polymers**

Potential for mobility in soil is low (Koc between 500 and 2000).

Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process.

Partition coefficient (Koc): 1800 - 4400 Estimated.

Limestone

No relevant data found.

2-Propenenitrile, polymer with 1,3-butadiene, carboxy-terminated, polymers with bisphenol A and epichlorohydrin

No relevant data found.

POLYURETHANE ADDUCT P99-0151

No relevant data found.

Polypropylene glycol diepoxide resin

No relevant data found.

Wollastonite (8Cl)

No relevant data found.

Calcium oxide

No relevant data found.

Talc

No data available.

1-Cyanoquanidine

Potential for mobility in soil is very high (Koc between 0 and 50).

Partition coefficient (Koc): 13 Estimated.

Dimethyl siloxane, reaction product with silica

No relevant data found.

Bisphenol A

Potential for mobility in soil is low (Koc between 500 and 2000).

Partition coefficient (Koc): 636 - 931 Measured

Carbon black

No relevant data found.

N,N-Dimethyl-N'-phenylurea

Potential for mobility in soil is high (Koc between 50 and 150).

Partition coefficient (Koc): 50.8 Estimated.

13. DISPOSAL CONSIDERATIONS

Disposal methods: DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER. All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator. AS YOUR SUPPLIER, WE HAVE NO CONTROL OVER THE MANAGEMENT PRACTICES OR MANUFACTURING PROCESSES OF PARTIES HANDLING OR USING THIS MATERIAL. THE INFORMATION PRESENTED HERE PERTAINS ONLY TO THE PRODUCT AS SHIPPED IN ITS INTENDED CONDITION AS DESCRIBED IN MSDS SECTION: Composition Information. FOR UNUSED & UNCONTAMINATED PRODUCT, the preferred options include sending to a licensed, permitted: Incinerator or other thermal destruction device.

Treatment and disposal methods of used packaging: Empty containers should be recycled or otherwise disposed of by an approved waste management facility. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator. Do not re-use containers for any purpose.

14. TRANSPORT INFORMATION

DOT

Not regulated for transport

Classification for SEA transport (IMO-IMDG):

Proper shipping name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.(Epoxy resin)
UN number	UN 3077
Class	9
Packing group	III
Marine pollutant	Epoxy resin
Transport in bulk according to Annex I or II of MARPOL 73/78 and the IBC or IGC Code	Consult IMO regulations before transporting ocean bulk

Classification for AIR transport (IATA/ICAO):

Proper shipping name	Environmentally hazardous substance, solid, n.o.s.(Epoxy resin)
UN number	UN 3077
Class	9
Packing group	III

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Transportation classifications may vary by container volume and may be influenced by regional or country variations in regulations. Additional transportation system information can be obtained through an authorized sales or customer service

representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

15. REGULATORY INFORMATION

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Sections 311 and 312

Skin corrosion or irritation
Serious eye damage or eye irritation
Respiratory or skin sensitisation
Reproductive toxicity

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Section 313

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

Components	CASRN
Bisphenol A	80-05-7

Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) Section 103

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

Pennsylvania Right To Know

The following chemicals are listed because of the additional requirements of Pennsylvania law:

Components	CASRN
Limestone	1317-65-3
Calcium oxide	1305-78-8
Talc	14807-96-6
Bisphenol A	80-05-7

California Prop. 65

WARNING: This product can expose you to chemicals including Bisphenol A, 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.

United States TSCA Inventory (TSCA)

All components of this product are in compliance with the inventory listing requirements of the U.S. Toxic Substances Control Act (TSCA) Chemical Substance Inventory.

16. OTHER INFORMATION

Hazard Rating System

NFPA

Health	Flammability	Instability
1	1	2

Revision

Identification Number: 297139 / A749 / Issue Date: 10/15/2018 / Version: 8.0

Most recent revision(s) are noted by the bold, double bars in left-hand margin throughout this document.

Legend

Dow IHG	Dow Industrial Hygiene Guideline
TWA	Time weighted average

Full text of other abbreviations

AICS - Australian Inventory of Chemical Substances; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

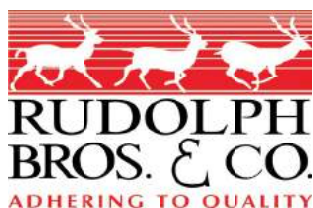
Information Source and References

This SDS is prepared by Product Regulatory Services and Hazard Communications Groups from information supplied by internal references within our company.

DDP SPECIALTY ELECTRONIC MATERIALS US, INC. urges each customer or recipient of this (M)SDS to study it carefully and consult appropriate expertise, as necessary or appropriate, to become aware of and understand the data contained in this (M)SDS and any hazards associated with the product. The information herein is provided in good faith and believed to be accurate as of the

effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ between various locations. It is the buyer's/user's responsibility to ensure that his activities comply with all federal, state, provincial or local laws. The information presented here pertains only to the product as shipped. Since conditions for use of the product are not under the control of the manufacturer, it is the buyer's/user's duty to determine the conditions necessary for the safe use of this product. Due to the proliferation of sources for information such as manufacturer-specific (M)SDSs, we are not and cannot be responsible for (M)SDSs obtained from any source other than ourselves. If you have obtained an (M)SDS from another source or if you are not sure that the (M)SDS you have is current, please contact us for the most current version.

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