



SAFETY DATA SHEET

THE DOW CHEMICAL COMPANY*

Product name: PARALOID™ AU-1453 Resin

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THE DOW CHEMICAL COMPANY* 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: PARALOID™ AU-1453 Resin

Recommended use of the chemical and restrictions on use

Identified uses: This product is used in coatings, textiles, binders and adhesives.

COMPANY IDENTIFICATION

THE DOW CHEMICAL COMPANY*
Agent for Rohm and Haas Chemicals LLC
400 ARCOLA ROAD
COLLEGEVILLE PA 19426-2914
UNITED STATES

Customer Information Number:

800-258-2436
SDSQuestion@dow.com

EMERGENCY TELEPHONE NUMBER

24-Hour Emergency Contact: 1 800 424 9300

Local Emergency Contact: 800-424-9300

2. HAZARDS IDENTIFICATION

Hazard classification

GHS classification in accordance with 29 CFR 1910.1200

Flammable liquids - Category 3

Skin sensitisation - Category 1

Reproductive toxicity - Category 2

Specific target organ toxicity - single exposure - Category 3

Label elements

Hazard pictograms



Signal word: **WARNING!**

Hazards

Flammable liquid and vapour.

May cause an allergic skin reaction.

May cause drowsiness or dizziness.

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.

Keep away from heat/sparks/open flames/hot surfaces. No smoking.

Keep container tightly closed.

Ground/bond container and receiving equipment.

Use explosion-proof electrical/ ventilating/ lighting equipment.

Use only non-sparking tools.

Take precautionary measures against static discharge.

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

Use only outdoors or in a well-ventilated area.

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

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

Response

IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.

IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor if you feel unwell.

IF exposed or concerned: Get medical advice/ attention.

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

Wash contaminated clothing before reuse.

In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.

Storage

Store in a well-ventilated place. Keep container tightly closed.

Store in a well-ventilated place. Keep cool.

Store locked up.

Disposal

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

Other hazards

No data available

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical nature: Polymers, solvent based

This product is a mixture.

Component

CASRN

Concentration

Acrylic polymer(s)	Not hazardous	67.0 - 70.0 %
Individual residual monomers	Not required	< 0.95 %
n-Butyl Acetate	123-86-4	29.0 - 30.0 %
Toluene	108-88-3	< 1.0 %
Styrene	100-42-5	>= 0.1 - < 1.0 %
Butyl methacrylate	97-88-1	>= 0.1 - < 1.0 %

4. FIRST AID MEASURES

Description of first aid measures

Inhalation: Move to fresh air. Give artificial respiration if breathing has stopped. If breathing is difficult, give oxygen. Get prompt medical attention.

Skin contact: Remove contaminated clothing. Wash affected skin areas thoroughly with soap and water. Get prompt medical attention. Wash contaminated clothing before re-use. Do not take clothing home to be laundered.

Eye contact: IMMEDIATELY flush eyes with a large amount of water for at least 15 minutes. Get prompt medical attention.

Ingestion: Drink 1 or 2 glasses of water. Never give anything by mouth to an unconscious person. IMMEDIATELY see a physician.

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: Treatment should be directed at preventing absorption, administering to symptoms (if they occur), and providing supportive therapy.

5. FIREFIGHTING MEASURES

Extinguishing media

Suitable extinguishing media: Use the following extinguishing media when fighting fires involving this material: polar solvent (alcohol) foam. Carbon dioxide (CO₂). Dry chemical. Water spray.

Unsuitable extinguishing media: No data available

Special hazards arising from the substance or mixture

Hazardous combustion products: No data available

Unusual Fire and Explosion Hazards: Vapors can travel to a source of ignition and flash back.. Heated material can form flammable or explosive vapors with air.. Closed containers may rupture via pressure build-up when exposed to fire or extreme heat..

Advice for firefighters

Fire Fighting Procedures: Move containers promptly out of fire zone. If removal is impossible, cool containers with water spray.. Remain upwind.. Avoid breathing smoke.. Contain run-off..

Special protective equipment for firefighters: Wear self-contained breathing apparatus and protective suit..

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures: Appropriate protective equipment must be worn when handling a spill of this material. See SECTION 8, Exposure Controls/Personal Protection, for recommendations. If exposed to material during clean-up operations, see SECTION 4, First Aid Measures, for actions to follow.

Environmental precautions: CAUTION: Keep spills and cleaning runoff out of municipal sewers and open bodies of water.

Methods and materials for containment and cleaning up: Evacuate personnel to safe areas. Eliminate all ignition sources including those beyond the immediate spill area. Ventilate the area. Avoid breathing vapor. Floor may be slippery; use care to avoid falling. Contain spills immediately with inert materials (e.g., sand, earth). Transfer liquids and solid diking material to separate suitable containers for recovery or disposal. CAUTION: Keep spills and cleaning runoff out of municipal sewers and open bodies of water.

7. HANDLING AND STORAGE

Precautions for safe handling: Vapors can be evolved when material is heated during processing operations. See SECTION 8, Exposure Controls/Personal Protection, for types of ventilation required. Ground all containers when transferring material. Use non-sparking tools and grounding cables when transferring. Wash after handling and shower at end of work period.

Conditions for safe storage: Avoid temperature extremes during storage; ambient temperature preferred. Store away from excessive heat (e.g. steampipes,radiators), from sources of ignition and from reactive materials. Ground all metal containers during storage and handling. Keep away from direct sunlight. Material can burn; limit indoor storage to approved areas equipped with automatic sprinklers. Keep container tightly closed when not in use. Avoid all ignition sources. Store in a cool, dry, well ventilated place.

Other data: CONTAINERS MAY BE HAZARDOUS WHEN EMPTY. Since emptied containers retain product residue follow all (M)SDS and label warnings even after container is emptied. Residual vapors in empty containers may explode on ignition. DO NOT cut, drill, grind or weld on or near container. Improper disposal or re-use of this container may be dangerous and illegal. Refer to applicable local, state and federal regulations. Dispose empty container in a sanitary landfill or by incineration as allowed by state and local authorities.

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
n-Butyl Acetate	Dow IHG	TWA	75 ppm
	Dow IHG	STEL	150 ppm
	OSHA Z-1	TWA	710 mg/m3 150 ppm
	Further information: (b): The value in mg/m3 is approximate.		
	ACGIH	TWA	50 ppm
	Further information: URT irr: Upper Respiratory Tract irritation; eye irr: Eye irritation		
	ACGIH	STEL	150 ppm
	Further information: URT irr: Upper Respiratory Tract irritation; eye irr: Eye irritation		
	OSHA P0	TWA	710 mg/m3 150 ppm
	OSHA P0	STEL	950 mg/m3 200 ppm
Toluene	ACGIH	TWA	20 ppm
	Further information: visual impair: Visual impairment; female repro: Female reproductive; pregnancy loss: Pregnancy loss; BEI: Substances for which there is a Biological Exposure Index or Indices (see BEI® section); A4: Not classifiable as a human carcinogen		
	OSHA Z-1		See Further information
	Further information: (2): See Table Z-2		
	OSHA Z-2	TWA	200 ppm
	Further information: Z37.12-1967		
	OSHA Z-2	CEIL	300 ppm
	Further information: Z37.12-1967		
	OSHA Z-2	Peak	500 ppm
	Further information: Z37.12-1967		
Styrene	OSHA Z-1		See Further information
	Further information: (2): See Table Z-2		
	OSHA Z-2	TWA	100 ppm
	Further information: Z37.15-1969		
	OSHA Z-2	CEIL	200 ppm
	Further information: Z37.15-1969		
	OSHA Z-2	Peak	600 ppm
	Further information: Z37.15-1969		
	ACGIH	TWA	20 ppm
	Further information: CNS impair: Central Nervous System impairment; URT irr: Upper Respiratory Tract irritation; peripheral neuropathy: Peripheral neuropathy; (): Adopted values or notations enclosed are those for which changes are proposed in the NIC; See Notice of Intended Changes (NIC); BEI: Substances for which there is a Biological Exposure Index or Indices (see BEI® section); A4: Not classifiable as a human carcinogen		
	ACGIH	STEL	40 ppm
	Further information: CNS impair: Central Nervous System impairment; URT irr: Upper Respiratory Tract irritation; peripheral neuropathy: Peripheral neuropathy; (): Adopted values or notations enclosed are those for which changes are proposed in the NIC; See Notice of Intended Changes (NIC); BEI: Substances for which there is a Biological Exposure Index or Indices (see BEI® section); A4: Not classifiable as a human carcinogen		
	OSHA P0	TWA	215 mg/m3 50 ppm
	OSHA P0	STEL	425 mg/m3 100 ppm
Butyl methacrylate	Dow IHG	TWA	50 ppm
	Dow IHG	STEL	75 ppm

Biological occupational exposure limits

Components	CAS-No.	Control parameters	Biological specimen	Sampling time	Permissible concentration	Basis
Toluene	108-88-3	Toluene	In blood	Prior to last shift of workweek	0.02 mg/l	ACGIH BEI
		Toluene	Urine	End of shift (As soon as possible after exposure ceases)	0.03 mg/l	ACGIH BEI
		o-Cresol	Urine	End of shift (As soon as possible after exposure ceases)	0.3 mg/g Creatinine	ACGIH BEI
Styrene	100-42-5	Mandelic acid plus phenylglyoxylic acid	Urine	End of shift (As soon as possible after exposure ceases)	400 mg/g Creatinine	ACGIH BEI
		Styrene	Urine	End of shift (As soon as possible after exposure ceases)	40 µg/l	ACGIH BEI

Exposure controls

Engineering controls: Use explosion-proof local exhaust ventilation with a minimum capture velocity of 100 ft/min (0.5 m/sec) at the point of vapor evolution. Refer to the current edition of Industrial Ventilation: A Manual of Recommended Practice published by the American Conference of Governmental Industrial Hygienists for information on the design, installation, use, and maintenance of exhaust systems.

Protective measures: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower.

Individual protection measures

Eye/face protection: Use chemical splash goggles (ANSI Z87.1 or approved equivalent). Eye protection worn must be compatible with respiratory protection system employed.

Skin protection

Hand protection: Chemical-resistant gloves should be worn whenever this material is handled. The glove(s) listed below may provide protection against permeation. (Gloves of other chemically resistant

materials may not provide adequate protection): Norfoil (Trademark of Siebe North, Inc.) Polyvinyl alcohol 4H Glove (Trademark of Safety 4 A/S of Denmark) Gloves should be removed and replaced immediately if there is any indication of degradation or chemical breakthrough. Rinse and remove gloves immediately after use. Wash hands with soap and water.

Other protection: Use chemically resistant apron or other impervious clothing to avoid prolonged or repeated skin contact.

Respiratory protection: A respiratory protection program meeting OSHA 1910.134 and ANSI Z88.2 requirements or equivalent must be followed whenever workplace conditions warrant a respirator's use. None required if airborne concentrations are maintained below the exposure limit listed in Exposure Limit Information. Up to 1000 ppm organic vapor: Wear a properly fitted NIOSH approved (or equivalent) full-facepiece, air-purifying respirator, OR full facepiece, airline respirator in the pressure demand mode. Above 1000 ppm organic vapor or Unknown: Wear a properly fitted NIOSH approved (or equivalent) self-contained breathing apparatus in the pressure demand mode, OR full-facepiece, airline respirator in the pressure demand mode with emergency escape provision. Air-purifying respirators should be equipped with NIOSH approved (or equivalent) organic vapor cartridges and N95 filters. If oil mist is present, use R95 or P95 filters.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Physical state	Clear to hazy liquid
Color	Colorless to yellow
Odor	Fruity odor
Odor Threshold	No data available
pH	Not applicable
Melting point/range	-73 °C (-99 °F) n-Butyl acetate
Freezing point	No data available
Boiling point (760 mmHg)	126 °C (259 °F) n-Butyl acetate
Flash point	24 °C (75 °F) <i>Tag closed cup</i> n-Butyl acetate
Evaporation Rate (Butyl Acetate = 1)	1 n-Butyl acetate
Flammability (solid, gas)	Not Applicable
Lower explosion limit	1.7 % vol n-Butyl acetate
Upper explosion limit	7.6 % vol n-Butyl acetate
Vapor Pressure	No data available
Relative Vapor Density (air = 1)	4.0 n-Butyl acetate
Relative Density (water = 1)	1.066
Water solubility	practically insoluble
Partition coefficient: n-octanol/water	No data available
Auto-ignition temperature	407 °C (765 °F) n-Butyl acetate
Decomposition temperature	Combustion generates toxic fumes of the following: Carbon oxides
Dynamic Viscosity	3,000 - 6,000 mPa.s at 20 °C (68 °F)
Kinematic Viscosity	No data available
Explosive properties	No data available

Oxidizing properties	No data available
Molecular weight	No data available
Percent volatility	29 - 30 %

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

10. STABILITY AND REACTIVITY

Reactivity: No data available

Chemical stability: No data available

Possibility of hazardous reactions: This material is considered stable. However, avoid contact with ignition sources (e.g. sparks, open flame, heated surfaces). Product will not undergo polymerization.

Conditions to avoid: No data available

Incompatible materials: Avoid contact with acids, alkalies and strong oxidizing agents.

Hazardous decomposition products: Thermal decomposition may yield acrylic monomers..

11. TOXICOLOGICAL INFORMATION

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

Acute toxicity

Acute oral toxicity

Product test data not available. Refer to component data.

Acute dermal toxicity

Product test data not available. Refer to component data.

Acute inhalation toxicity

Product test data not available. Refer to component data.

Skin corrosion/irritation

Product test data not available. Refer to component data.

Serious eye damage/eye irritation

Product test data not available. Refer to component data.

Sensitization

Product test data not available. Refer to component data.

Specific Target Organ Systemic Toxicity (Single Exposure)

Product test data not available. Refer to component data.

Specific Target Organ Systemic Toxicity (Repeated Exposure)

Product test data not available. Refer to component data.

Carcinogenicity

Product test data not available. Refer to component data.

Teratogenicity

Product test data not available. Refer to component data.

Reproductive toxicity

Product test data not available. Refer to component data.

Mutagenicity

Product test data not available. Refer to component data.

Aspiration Hazard

Product test data not available. Refer to component data.

Additional information

No toxicity data are available for this material.

The information shown in SECTION 3, Hazards Identification, is based on to present in this material.

COMPONENTS INFLUENCING TOXICOLOGY:

Acrylic polymer(s)

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.

Skin corrosion/irritation

Essentially nonirritating to skin.

Serious eye damage/eye irritation

Essentially nonirritating to eyes.

Sensitization

For skin sensitization:

No relevant data found.

For respiratory sensitization:

No relevant data found.

Specific Target Organ Systemic Toxicity (Single Exposure)

The substance or mixture is not classified as specific target organ toxicant, single exposure.

Specific Target Organ Systemic Toxicity (Repeated Exposure)

No relevant data found.

Carcinogenicity

No relevant data found.

Teratogenicity

No relevant data found.

Reproductive toxicity

No relevant data found.

Mutagenicity

No relevant data found.

Aspiration Hazard

No aspiration toxicity classification

n-Butyl Acetate

Acute oral toxicity

LD50, Rat, male, 12,789 mg/kg

LD50 Oral, Rat, female, 10,760 mg/kg

Acute dermal toxicity

LD50, Rabbit, male and female, > 14,112 mg/kg

Acute inhalation toxicity

The LC50 has not been determined.

Skin corrosion/irritation

Brief contact is essentially nonirritating to skin.

Prolonged contact may cause severe skin irritation with local redness and discomfort.

May cause drying and flaking of the skin.

Serious eye damage/eye irritation

May cause moderate eye irritation.

Corneal injury is unlikely.

Vapor may cause eye irritation experienced as mild discomfort and redness.

Sensitization

Did not cause allergic skin reactions when tested in guinea pigs.

Did not cause allergic skin reactions when tested in humans.

For respiratory sensitization:

No relevant data found.

Specific Target Organ Systemic Toxicity (Single Exposure)

May cause drowsiness or dizziness.

Route of Exposure: Inhalation

Target Organs: Nervous system

Specific Target Organ Systemic Toxicity (Repeated Exposure)

In animals, effects have been reported on the following organs:

Nasal tissue.

Carcinogenicity

No relevant data found.

Teratogenicity

Has been toxic to the fetus in laboratory animals at doses toxic to the mother. Did not cause birth defects in laboratory animals.

Reproductive toxicity

In laboratory animal studies, effects on reproduction have been seen only at doses that produced significant toxicity to the parent animals. In animal studies, did not interfere with fertility.

Mutagenicity

In vitro genetic toxicity studies were negative.

Aspiration Hazard

Aspiration into the lungs may occur during ingestion or vomiting, causing lung damage or even death due to chemical pneumonia.

Toluene

Acute oral toxicity

LD50, Rat, 5,580 mg/kg

Acute dermal toxicity

LD50, Rabbit, 12,267 mg/kg

Acute inhalation toxicity

Symptoms may include headache, dizziness and drowsiness, progressing to incoordination and unconsciousness. Alcohol consumption and exertion may increase the adverse effects of toluene. LC50, Rat, male, 4 Hour, vapour, 25.7 mg/l

LC50, Rat, female, 4 Hour, vapour, 30 mg/l

Skin corrosion/irritation

Brief contact may cause slight skin irritation with local redness.
Prolonged contact may cause moderate skin irritation with local redness.
May cause drying and flaking of the skin.

Serious eye damage/eye irritation

May cause slight eye irritation.
May cause slight temporary corneal injury.
Vapor may cause eye irritation experienced as mild discomfort and redness.
Vapor may cause lacrimation (tears).

Sensitization

Did not cause allergic skin reactions when tested in guinea pigs.

For respiratory sensitization:
No relevant data found.

Specific Target Organ Systemic Toxicity (Single Exposure)

May cause drowsiness or dizziness.
Route of Exposure: Inhalation
Target Organs: Central nervous system

Specific Target Organ Systemic Toxicity (Repeated Exposure)

In animals, effects have been reported on the following organs:

central nervous system (CNS) effects

Excessive exposure may cause neurologic signs and symptoms.

Toluene has caused hearing loss in laboratory animals upon exposure to high concentrations.

Intentional misuse by deliberately inhaling toluene may cause nervous system damage, hearing loss, liver and kidney effects and death.

Carcinogenicity

Did not cause cancer in laboratory animals.

Teratogenicity

In laboratory animals, toluene has been toxic to the fetus at doses toxic to the mother; it has caused birth defects in mice when administered orally, but not by inhalation.

Reproductive toxicity

In animal studies, did not interfere with reproduction.

Mutagenicity

The majority and most reliable of the many genetic toxicity studies on toluene, both in vitro and in animals, indicate that it is not genetically toxic.

Aspiration Hazard

May be fatal if swallowed and enters airways.

Styrene

Acute oral toxicity

LD50, Rat, 5,000 mg/kg

Acute dermal toxicity

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

Acute inhalation toxicity

Vapor concentrations are attainable which could be hazardous on single exposure. Excessive exposure may cause irritation to upper respiratory tract (nose and throat). Symptoms of excessive exposure may be anesthetic or narcotic effects; dizziness and drowsiness may be observed.

LC50, Rat, 4 Hour, vapour, 11.8 mg/l

Skin corrosion/irritation

Prolonged contact may cause skin irritation with local redness.

Repeated contact may cause skin burns. Symptoms may include pain, severe local redness, swelling, and tissue damage.

May cause drying and flaking of the skin.

Serious eye damage/eye irritation

May cause moderate eye irritation.

May cause moderate corneal injury.

Vapor may cause eye irritation experienced as mild discomfort and redness.

Vapor may cause lacrimation (tears).

Sensitization

For skin sensitization:
No relevant data found.

For respiratory sensitization:
No relevant data found.

Specific Target Organ Systemic Toxicity (Single Exposure)

May cause respiratory irritation.

Route of Exposure: Inhalation

Target Organs: Respiratory Tract

Specific Target Organ Systemic Toxicity (Repeated Exposure)

In animals, effects have been reported on the following organs:

Central nervous system.

Kidney.

Liver.

Respiratory tract.

Lung effects have been observed in mice following repeated exposure to styrene.

Styrene is reported to have caused hearing loss in laboratory animals. Chronic and intensive styrene exposure is reported to reduce the hearing thresholds in workers.

Some studies in humans allege that repeated exposure to styrene may result in minor, subclinical decreases in the ability to discriminate between colors.

Carcinogenicity

An increased incidence of lung tumors was observed in mice from an inhalation study on styrene. The relevance of this finding to humans is uncertain since data from mode of action investigations of mouse lung tumors coupled with other long-term animal studies and epidemiology studies of workers exposed to styrene do not provide a basis to conclude that styrene is carcinogenic.

Teratogenicity

Has been toxic to the fetus in laboratory animals at doses toxic to the mother. Did not cause birth defects in laboratory animals.

Reproductive toxicity

In animal studies, did not interfere with reproduction.

Mutagenicity

In vitro genetic toxicity studies were inconclusive. Animal genetic toxicity studies were inconclusive

Aspiration Hazard

May be fatal if swallowed and enters airways.

Butyl methacrylate

Acute oral toxicity

Very low toxicity if swallowed. Harmful effects not anticipated from swallowing small amounts.

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

Acute dermal toxicity

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

LD50, Rabbit, male and female, > 2,000 mg/kg OECD Test Guideline 402

Acute inhalation toxicity

Prolonged exposure is not expected to cause adverse effects. Vapor may cause irritation of the upper respiratory tract (nose and throat).

LC50, Rat, male and female, 4 Hour, dust/mist, 29 mg/l OECD Test Guideline 403

Skin corrosion/irritation

Brief contact may cause moderate skin irritation with local redness.

Serious eye damage/eye irritation

May cause slight eye irritation.
Corneal injury is unlikely.

Sensitization

Skin contact may cause an allergic skin reaction.

For respiratory sensitization:
No relevant data found.

Specific Target Organ Systemic Toxicity (Single Exposure)

May cause respiratory irritation.
Route of Exposure: Inhalation
Target Organs: Respiratory Tract

Specific Target Organ Systemic Toxicity (Repeated Exposure)

Based on available data, repeated exposures are not anticipated to cause additional significant adverse effects.

Carcinogenicity

For similar material(s): Did not cause cancer in laboratory animals.

Teratogenicity

Has been toxic to the fetus in laboratory animals at doses toxic to the mother.

Reproductive toxicity

In animal studies, a similar material has been shown not to interfere with reproduction.

Mutagenicity

In vitro genetic toxicity studies were negative. Animal genetic toxicity studies were negative.

Aspiration Hazard

Aspiration into the lungs may occur during ingestion or vomiting, causing lung damage or even death due to chemical pneumonia.

Carcinogenicity

Component
Styrene

List
IARC

US NTP

Classification

Group 2A: Probably carcinogenic to humans

Reasonably anticipated to be a human carcinogen

12. ECOLOGICAL INFORMATION

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

General Information

There is no data available for this product.

Toxicity

Acrylic polymer(s)

Acute toxicity to fish

No relevant data found.

n-Butyl Acetate

Acute toxicity to fish

Material is slightly toxic to aquatic organisms on an acute basis (LC50/EC50 between 10 and 100 mg/L in the most sensitive species tested).

LC50, Pimephales promelas (fathead minnow), flow-through test, 96 Hour, 18 mg/l

Acute toxicity to aquatic invertebrates

LC50, Daphnia magna (Water flea), 48 Hour, 44 mg/l

Acute toxicity to algae/aquatic plants

ErC50, Desmodesmus subspicatus (green algae), 72 Hour, Growth rate inhibition, 648 mg/l

Toxicity to bacteria

EC50, Bacteria, 16 Hour, > 1,000 mg/l

Chronic toxicity to aquatic invertebrates

NOEC, Daphnia magna (Water flea), 21 d, 23 mg/l

Toluene

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, 5.8 mg/l

Acute toxicity to aquatic invertebrates

LC50, water flea Ceriodaphnia dubia, semi-static test, 48 Hour, 3.78 mg/l

Acute toxicity to algae/aquatic plants

EbC50, Pseudokirchneriella subcapitata (green algae), 72 Hour, Biomass, 12.5 mg/l, OECD Test Guideline 201

Toxicity to bacteria

IC50, Bacteria, 16 Hour, 29 mg/l

Chronic toxicity to fish

NOEC, Fish, flow-through test, 40 d, growth, 1.4 mg/l

Chronic toxicity to aquatic invertebrates

NOEC, Ceriodaphnia dubia (water flea), 7 d, number of offspring, 0.74 mg/l

Toxicity to soil-dwelling organisms

LC50, Eisenia fetida (earthworms), 150 - 280 mg/kg

Styrene

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), static test, 96 Hour, 4.1 mg/l, OECD Test Guideline 203 or Equivalent

Acute toxicity to aquatic invertebrates

LC50, Daphnia magna (Water flea), static test, 48 Hour, 23 mg/l, OECD Test Guideline 202 or Equivalent

EC50, Daphnia magna (Water flea), flow-through test, 48 Hour, 4.7 mg/l, OECD Test Guideline 202 or Equivalent

Acute toxicity to algae/aquatic plants

ErC50, Pseudokirchneriella subcapitata (green algae), static test, 72 Hour, Growth rate inhibition, 4.9 mg/l, OECD Test Guideline 201 or Equivalent

EC10, Pseudokirchneriella subcapitata (green algae), static test, 96 Hour, Growth rate inhibition, 0.28 mg/l, OECD Test Guideline 201 or Equivalent

Toxicity to bacteria

NOEC, Pseudomonas putida, 16 Hour, 72 mg/l

Chronic toxicity to aquatic invertebrates

NOEC, Daphnia magna (Water flea), 21 d, 1.01 mg/l

Toxicity to soil-dwelling organisms

LC50, Eisenia fetida (earthworms), 14 d, 120 mg/kg

Butyl methacrylate

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, Pimephales promelas (fathead minnow), flow-through test, 96 Hour, 11 mg/l, OECD Test Guideline 203

Material is toxic to aquatic organisms (LC50/EC50/IC50 between 1 and 10 mg/L in the most sensitive species).

LC50, Oryzias latipes (Japanese medaka), semi-static test, 96 Hour, 5.57 mg/l, OECD Test Guideline 203

Acute toxicity to aquatic invertebrates

EC50, Daphnia magna (Water flea), static test, 48 Hour, 25.4 mg/l, OECD Test Guideline 202

Acute toxicity to algae/aquatic plants

ErC50, Pseudokirchneriella subcapitata (algae), static test, 72 Hour, Growth rate, 31.2 mg/l, OECD Test Guideline 201

NOEC, Pseudokirchneriella subcapitata (algae), static test, 72 Hour, Growth rate, 24.8 mg/l, OECD Test Guideline 201

Toxicity to bacteria

EC10, Pseudomonas putida, 18 Hour, 253.6 mg/l

Chronic toxicity to aquatic invertebrates

NOEC, Daphnia (water flea), semi-static test, 21 d, 1.1 mg/l

Persistence and degradability**Acrylic polymer(s)****Biodegradability:** No relevant data found.**n-Butyl Acetate****Biodegradability:** Material is readily biodegradable. Passes OECD test(s) for ready biodegradability.

10-day Window: Pass

Biodegradation: 83 %**Exposure time:** 28 d**Method:** OECD Test Guideline 301D or Equivalent**Theoretical Oxygen Demand:** 2.20 mg/mg Estimated.**Photodegradation****Sensitization:** OH radicals**Atmospheric half-life:** 2.32 d**Method:** Estimated.**Toluene****Biodegradability:** Material is readily biodegradable. Passes OECD test(s) for ready biodegradability.

10-day Window: Not applicable

Biodegradation: 100 %**Exposure time:** 14 d**Method:** OECD Test Guideline 301C or Equivalent**Theoretical Oxygen Demand:** 3.13 mg/mg Calculated.**Photodegradation****Test Type:** Half-life (indirect photolysis)**Sensitization:** OH radicals**Atmospheric half-life:** 2 d**Method:** Estimated.**Styrene****Biodegradability:** Biodegradation under aerobic static laboratory conditions is high (BOD20 or BOD28/ThOD > 40%). Material is expected to be readily biodegradable. Material is ultimately biodegradable (reaches > 70% mineralization in OECD test(s) for inherent biodegradability).

10-day Window: Pass

Biodegradation: 87 %**Exposure time:** 28 d**Method:** OECD Test Guideline 301F or Equivalent**Theoretical Oxygen Demand:** 3.08 mg/mg**Chemical Oxygen Demand:** 2.89 mg/mg Dichromate

Biological oxygen demand (BOD)

Incubation Time	BOD
5 d	34 %
10 d	47 %
20 d	54 %

Photodegradation**Test Type:** Half-life (indirect photolysis)**Sensitization:** OH radicals**Atmospheric half-life:** 3.5 Hour**Method:** Estimated.**Butyl methacrylate****Biodegradability:** 10-day Window: Not applicable**Biodegradation:** 88 %**Exposure time:** 28 d**Method:** OECD Test Guideline 301C

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

Bioaccumulative potential**Acrylic polymer(s)****Bioaccumulation:** No relevant data found.**n-Butyl Acetate****Bioaccumulation:** Bioconcentration potential is low (BCF < 100 or Log Pow < 3).**Partition coefficient: n-octanol/water(log Pow):** Pow: 3.2 at 25 °C Measured**Bioconcentration factor (BCF):** 15 Fish Estimated.**Toluene****Bioaccumulation:** Bioconcentration potential is low (BCF < 100 or Log Pow < 3).**Partition coefficient: n-octanol/water(log Pow):** 2.73 Measured**Bioconcentration factor (BCF):** 13.2 - 90 Fish Measured**Styrene****Bioaccumulation:** Bioconcentration potential is low (BCF < 100 or Log Pow < 3).**Partition coefficient: n-octanol/water(log Pow):** 2.95 Measured**Bioconcentration factor (BCF):** 13.5 Fish Measured**Butyl methacrylate****Bioaccumulation:** Bioconcentration potential is low (BCF < 100 or Log Pow < 3).**Partition coefficient: n-octanol/water(log Pow):** 3 at 25 °C Estimated.**Bioconcentration factor (BCF):** 70 Fish Calculated.**Mobility in soil****Acrylic polymer(s)**

No relevant data found.

n-Butyl Acetate

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

Partition coefficient (Koc): 19 - 70 Estimated.

Toluene

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

Partition coefficient (Koc): 37 - 178 Estimated.

Styrene

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

Partition coefficient (Koc): 520 - 920 Estimated.

Butyl methacrylate

For similar material(s):

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

Partition coefficient (Koc): 2760 Estimated.

13. DISPOSAL CONSIDERATIONS

Disposal methods: Incinerate liquid and contaminated solids in accordance with local, state, and federal regulations.

Contaminated packaging: Empty containers retain product residues. Follow label warnings even after container is emptied. Improper disposal or reuse of this container may be dangerous and illegal. Refer to applicable federal, state and local regulations.

14. TRANSPORT INFORMATION

DOT

Proper shipping name	Resin solution
UN number	UN 1866
Class	3
Packing group	III
Reportable Quantity	Butyl acetates

Classification for SEA transport (IMO-IMDG):

Proper shipping name	RESIN SOLUTION
UN number	UN 1866
Class	3
Packing group	III
Marine pollutant	No
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	Resin solution
UN number	UN 1866
Class	3
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

Flammable (gases, aerosols, liquids, or solids)
 Respiratory or skin sensitisation
 Reproductive toxicity
 Specific target organ toxicity (single or repeated exposure)

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
Styrene	100-42-5

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

Calculated RQ exceeds reasonably attainable upper limit.

Components	CASRN	RQ (RCRA Code)
Toluene	108-88-3	1000 lbs RQ
Toluene	108-88-3	100 lbs RQ (F005)
n-Butyl Acetate	123-86-4	5000 lbs RQ

Pennsylvania

Any material listed as "Not Hazardous" in the CAS REG NO. column of SECTION 2, Composition/Information On Ingredients, of this MSDS is a trade secret under the provisions of the Pennsylvania Worker and Community Right-to-Know Act.

California Prop. 65

WARNING: This product can expose you to chemicals including Styrene, which is/are known to the State of California to cause cancer, and Toluene, 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

HMIS

Health	Flammability	Physical Hazard
3*	3	0

* = Chronic Effects (See Hazards Identification)

Revision

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

Legend

ACGIH	USA. ACGIH Threshold Limit Values (TLV)
ACGIH BEI	ACGIH - Biological Exposure Indices (BEI)
CEIL	Acceptable ceiling concentration
Dow IHG	Dow Industrial Hygiene Guideline
OSHA P0	USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000
OSHA Z-1	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
OSHA Z-2	USA. Occupational Exposure Limits (OSHA) - Table Z-2
Peak	Acceptable maximum peak above the acceptable ceiling concentration for an 8-hr shift
STEL	Short term exposure limit
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.

THE DOW CHEMICAL COMPANY* 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.

US