SAFETY DATA SHEET
THE DOW CHEMICAL COMPANY

Product name: BETACLEAN™ U-424 Urethane Adhesive Cleaner

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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: BETACLEAN™ U-424 Urethane Adhesive Cleaner

Recommended use of the chemical and restrictions on use
Identified uses: Cleaner. For use in automotive applications.

COMPANY IDENTIFICATION
THE DOW CHEMICAL COMPANY
2030 DOW CENTER
MIDLAND MI 48674-0000
UNITED STATES

Customer Information Number: 800-258-2436
SDSQuestion@dow.com

EMERGENCY TELEPHONE NUMBER
24-Hour Emergency Contact: CHEMTREC +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 4
Skin irritation - Category 2
Eye irritation - Category 2B

Label elements
Hazard pictograms



Signal word: **WARNING!**

Hazards
Combustible liquid.
Causes skin and eye irritation.

Precautionary statements

Prevention
Keep away from heat/sparks/open flames/hot surfaces. No smoking.
Wash skin thoroughly after handling.
Wear protective gloves/ 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 skin irritation occurs: Get medical advice/ attention.
If eye irritation persists: Get medical advice/ attention.
Take off contaminated clothing and wash before reuse.
In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
In case of fire: Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide to extinguish.

Storage
Store in a well-ventilated place. Keep cool.

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

Other hazards
No data available

3. COMPOSITION/INFORMATION ON INGREDIENTS

Synonyms: (2-methoxymethylethoxy)propanol
This product is a substance.

Component	CASRN	Concentration
Dipropylene glycol monomethyl ether	34590-94-8	> 85.0 - < 95.0 %
1-Butoxy-2-propanol	5131-66-8	> 5.0 - < 15.0 %
Methyl salicylate	119-36-8	< 5.0 %

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 not breathing, give artificial respiration; if by mouth to mouth use rescuer protection (pocket mask, etc). If breathing is difficult, oxygen should be administered by qualified personnel. Call a physician or transport to a medical facility.

Skin contact: Wash off with plenty of water. Suitable emergency safety shower facility should be available in work area.

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: Maintain adequate ventilation and oxygenation of the patient. If burn is present, treat as any thermal burn, after decontamination. 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.

Unsuitable extinguishing media: No data available

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: Carbon monoxide. Carbon dioxide.

Unusual Fire and Explosion Hazards: Container may rupture from gas generation in a fire situation. Violent steam generation or eruption may occur upon application of direct water stream to hot liquids.

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. Immediately withdraw all personnel from the area in case of rising sound from venting safety device or discoloration of the container. Burning liquids may be extinguished by dilution with water. Do not use direct water stream. May spread fire. Move container from fire area if

this is possible without hazard. Burning liquids may be moved by flushing with water to protect personnel and minimize property damage.

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). If protective equipment is not available or not used, fight fire from a protected location or safe distance.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures: Isolate area. Keep unnecessary and unprotected personnel from entering the area. Keep upwind of spill. Ventilate area of leak or spill. No smoking in area. Refer to section 7, Handling, for additional precautionary measures. 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: Keep away from heat, sparks and flame. Avoid contact with eyes, skin, and clothing. Do not swallow. Avoid breathing vapor. Wash thoroughly after handling. Keep container closed. Use with adequate ventilation. Containers, even those that have been emptied, can contain vapors. Do not cut, drill, grind, weld, or perform similar operations on or near empty containers. Spills of these organic materials on hot fibrous insulations may lead to lowering of the autoignition temperatures possibly resulting in spontaneous combustion. See Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION.

Conditions for safe storage: Store in accordance with good manufacturing practices.

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
Dipropylene glycol monomethyl ether	Dow IHG	TWA	10 ppm
	Dow IHG	TWA	SKIN
	Dow IHG	STEL	30 ppm
	Dow IHG	STEL	SKIN

	ACGIH	TWA		100 ppm
	ACGIH	STEL		150 ppm
	ACGIH	TWA		SKIN
	OSHA Z-1	TWA	600 mg/m3	100 ppm
	ACGIH	STEL		SKIN
	OSHA Z-1	TWA		SKIN
1-Butoxy-2-propanol	Dow IHG	TWA		50 ppm
Methyl salicylate	Dow IHG	TWA		150 ppm
	Dow IHG	STEL		185 ppm

Exposure controls
Engineering controls: Use engineering controls to maintain airborne level below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, use only with adequate ventilation. Local exhaust ventilation may be necessary for some operations.

Individual protection measures

Eye/face protection: Use chemical goggles.

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"). Examples of acceptable glove barrier materials include: Neoprene. Natural rubber ("latex"). Polyvinyl chloride ("PVC" or "vinyl"). Nitrile/butadiene rubber ("nitrile" or "NBR"). 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, use an approved respirator. Selection of air-purifying or positive-pressure supplied-air will depend on the specific operation and the potential airborne concentration of the material. For emergency conditions, use an approved positive-pressure self-contained breathing apparatus.

The following should be effective types of air-purifying respirators: Organic vapor cartridge with a particulate pre-filter.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	
Physical state	Liquid.
Color	Colorless
Odor	Fruity
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** 81 °C (178 °F) *PMCC, ASTM D93*
Evaporation Rate (Butyl Acetate = 1)	No test data available
Flammability (solid, gas)	No
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)	0.95 *ASTM D1475*
Water solubility	No test data available
Partition coefficient: n-octanol/water	No data available
Auto-ignition temperature	No test data available
Decomposition temperature	No test data available
Kinematic Viscosity	No test data available
Explosive properties	No test data available
Oxidizing properties	No test data available
Molecular weight	No test data available
Volatile Organic Compounds	7.94 lb/gln *EPA Method No. 24* (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 data available

Chemical stability: Thermally stable at typical use temperatures.

Possibility of hazardous reactions: Polymerization will not occur.

Conditions to avoid: Do not distill to dryness. Product can oxidize at elevated temperatures. Generation of gas during decomposition can cause pressure in closed systems.

Incompatible materials: Avoid contact with: Strong acids. Strong bases. Strong oxidizers.

Hazardous decomposition products: Decomposition products depend upon temperature, air supply and the presence of other materials. Decomposition products can include and are not limited to: Carbon dioxide. Carbon monoxide.

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. Swallowing may result in gastrointestinal irritation. May cause nausea and vomiting.
Single dose oral LD50 has not been determined.

Acute dermal toxicity

Prolonged skin contact with very large amounts may cause dizziness or drowsiness.
The dermal LD50 has not been determined.

Acute inhalation toxicity

Prolonged excessive exposure may cause adverse effects. Mist may cause irritation of upper respiratory tract (nose and throat). Symptoms of excessive exposure may be anesthetic or narcotic effects; dizziness and drowsiness may be observed.
The LC50 has not been determined.

Skin corrosion/irritation

Brief contact may cause slight skin irritation with local redness.
Prolonged contact may cause moderate skin irritation with local redness.

Serious eye damage/eye irritation

May cause moderate eye irritation.
May cause slight corneal injury.

Sensitization

For skin sensitization:
For the component(s) tested:
Did not cause allergic skin reactions when tested 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)

Contains component(s) which have been reported to cause effects on the following organs in animals:
Kidney.
Liver.
Repeated exposures (typically by ingestion) of salicylic acid may cause gastrointestinal irritation; toxic or high doses may cause ringing in the ears, nausea, vomiting, metabolic disturbances and possibly kidney damage.

Carcinogenicity

Contains component(s) which did not cause cancer in laboratory animals.

Teratogenicity

Contains component(s) which caused birth defects in laboratory animals only at doses toxic to the mother. Contains component(s) which have been toxic to the fetus in lab animal tests.

Reproductive toxicity

In animal studies on component(s), effects on reproduction were seen only at doses that produced significant toxicity to the parent animals.

Mutagenicity
For the component(s) tested: In vitro genetic toxicity studies were negative.

Aspiration Hazard
Based on available information, aspiration hazard could not be determined.

COMPONENTS INFLUENCING TOXICOLOGY:

Dipropylene glycol monomethyl ether

Acute oral toxicity
LD50, Rat, > 5,000 mg/kg

Acute dermal toxicity
LD50, Rabbit, 9,510 mg/kg

Acute inhalation toxicity
LC50, Rat, 7 Hour, vapour, 3.35 mg/l No deaths occurred at this concentration.

1-Butoxy-2-propanol

Acute oral toxicity
LD50, Rat, male and female, 3,300 mg/kg

Acute dermal toxicity
LD50, Rat, male and female, > 2,000 mg/kg No deaths occurred at this concentration.

Acute inhalation toxicity
Brief exposure (minutes) is not likely to cause adverse effects. For respiratory irritation and narcotic effects: No relevant data found.

LC50, Rat, 4 Hour, vapour, > 3.52 mg/l No deaths occurred at this concentration.

Methyl salicylate

Acute oral toxicity
LD50, Rat, male and female, 887 mg/kg OECD 401 or equivalent

Acute dermal toxicity
The dermal LD50 has not been determined.

Acute inhalation toxicity
LC50, Rat, male, 4 Hour, vapour, > 3.6 mg/l No deaths occurred at this concentration.

12. ECOLOGICAL INFORMATION

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

Toxicity

Dipropylene glycol monomethyl ether

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, Poecilia reticulata (guppy), static test, 96 Hour, > 1,000 mg/l, OECD Test Guideline 203 or Equivalent

Acute toxicity to aquatic invertebrates
LC50, Daphnia magna (Water flea), static test, 48 Hour, 1,919 mg/l, OECD Test Guideline 202 or Equivalent
LC50, Crangon crangon (shrimp), semi-static test, 96 Hour, > 1,000 mg/l, OECD Test Guideline 202 or Equivalent
LC50, copepod Acartia tonsa, static test, 48 Hour, 2,070 mg/l, ISO TC147/SC5/WG2

Acute toxicity to algae/aquatic plants
ErC50, Pseudokirchneriella subcapitata (green algae), static test, 96 Hour, Biomass, > 969 mg/l, OECD Test Guideline 201 or Equivalent

Toxicity to bacteria
EC10, Pseudomonas putida, 18 Hour, 4,168 mg/l

Chronic toxicity to aquatic invertebrates
NOEC, Daphnia magna (Water flea), flow-through test, 22 d, > 0.5 mg/l
LOEC, Daphnia magna (Water flea), flow-through test, 22 d, > 0.5 mg/l
MATC (Maximum Acceptable Toxicant Level), Daphnia magna (Water flea), flow-through test, 22 d, > 0.5 mg/l

1-Butoxy-2-propanol

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, Poecilia reticulata (guppy), static test, 96 Hour, > 560 - 1,000 mg/l, OECD Test Guideline 203 or Equivalent

Acute toxicity to aquatic invertebrates
EC50, Daphnia magna (Water flea), static test, 48 Hour, > 1,000 mg/l, OECD Test Guideline 202 or Equivalent

Acute toxicity to algae/aquatic plants
EC50, Pseudokirchneriella subcapitata (green algae), static test, 96 Hour, Growth inhibition (cell density reduction), > 1,000 mg/l, OECD Test Guideline 201 or Equivalent
NOEC, Pseudokirchneriella subcapitata (green algae), static test, 96 Hour, Growth inhibition (cell density reduction), 560 mg/l, OECD Test Guideline 201 or Equivalent

Toxicity to bacteria
EC50, Bacteria, static test, 3 Hour, > 1,000 mg/l, OECD Test Guideline 209

Methyl salicylate

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).
Danio rerio (zebra fish), static test, 96 Hour, > 100 mg/l, OECD Test Guideline 203 or Equivalent

Acute toxicity to aquatic invertebrates
EC50, Daphnia magna (Water flea), 24 Hour, 50 mg/l, Method Not Specified.

Acute toxicity to algae/aquatic plants
ErC50, Desmodesmus subspicatus (green algae), static test, 72 Hour, 1.6 mg/l

Persistence and degradability

Dipropylene glycol monomethyl ether

Biodegradability: Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Material is ultimately biodegradable (reaches > 70% mineralization in OECD test(s) for inherent biodegradability).
10-day Window: Pass
Biodegradation: 75 %
Exposure time: 28 d
Method: OECD Test Guideline 301F or Equivalent

Theoretical Oxygen Demand: 2.06 mg/mg

Chemical Oxygen Demand: 2.02 mg/mg Dichromate

Biological oxygen demand (BOD)

Incubation Time	BOD
5 d	0 %
10 d	0 %
20 d	31.6 %

Photodegradation
Test Type: Half-life (indirect photolysis)
Sensitization: OH radicals
Atmospheric half-life: 3.4 - 10.4 Hour
Method: Estimated.

1-Butoxy-2-propanol

Biodegradability: Material is readily biodegradable. Passes OECD test(s) for ready biodegradability.
10-day Window: Not applicable
Biodegradation: 85 - 92 %
Exposure time: 28 d
Method: OECD Test Guideline 301C or Equivalent
10-day Window: Pass
Biodegradation: 90 %
Exposure time: 28 d
Method: OECD Test Guideline 301E

Theoretical Oxygen Demand: 2.42 mg/mg

Biological oxygen demand (BOD)

Incubation Time	BOD
5 d	1.1 - 1.5 %
20 d	6.6 - 33.3 %

Methyl salicylate

Biodegradability: Material is expected to be readily biodegradable.
10-day Window: Pass
Biodegradation: 98.4 %
Exposure time: 28 d
Method: OECD Test Guideline 301B or Equivalent

Bioaccumulative potential

Dipropylene glycol monomethyl ether

Bioaccumulation: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).
Partition coefficient: n-octanol/water(log Pow): 0.006 Measured

1-Butoxy-2-propanol

Bioaccumulation: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).
Partition coefficient: n-octanol/water(log Pow): 1.2 at 20 °C Measured

Methyl salicylate

Bioaccumulation: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).
Partition coefficient: n-octanol/water(log Pow): 2.55 Measured

Mobility in soil

Dipropylene glycol monomethyl ether

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.
Potential for mobility in soil is very high (Koc between 0 and 50).
Partition coefficient (Koc): 0.28 Estimated.

1-Butoxy-2-propanol

Potential for mobility in soil is very high (Koc between 0 and 50).
Partition coefficient (Koc): 1.3 - 6.0 Estimated.

Methyl salicylate

Potential for mobility in soil is medium (Koc between 150 and 500).
Partition coefficient (Koc): 222 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

Proper shipping name	Combustible liquid, n.o.s.(Dipropylene glycol monomethyl ether)
UN number	NA 1993
Class	CBL
Packing group	III

Classification for SEA transport (IMO-IMDG):

	Not regulated for transport
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):

Not regulated for transport

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)
Skin corrosion or irritation
Serious eye damage or eye irritation

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Section 313
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

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
Dipropylene glycol monomethyl ether	34590-94-8
Methyl salicylate	119-36-8

California Prop. 65
This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

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	2	0

Revision
Identification Number: 240630 / A001 / Issue Date: 06/07/2018 / Version: 10.1
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)
Dow IHG	Dow Industrial Hygiene Guideline
OSHA Z-1	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
SKIN	Absorbed via skin
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