SAFETY DATA SHEET
THE DOW CHEMICAL COMPANY

Product name: CR 9-101

Issue Date: 02/18/2022
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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: CR 9-101

Recommended use of the chemical and restrictions on use
Identified uses: Packaging laminating adhesives

COMPANY IDENTIFICATION
THE DOW CHEMICAL COMPANY
2211 H.H. DOW WAY
MIDLAND MI 48674
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 the OSHA Hazard Communication Standard (29 CFR 1910.1200)
Acute toxicity - Category 4 - Inhalation
Skin sensitisation - Category 1
Specific target organ toxicity - single exposure - Category 3

Label elements
Hazard pictograms

Signal word: **WARNING!**

Hazards
May cause an allergic skin reaction.
Harmful if inhaled.
May cause respiratory irritation.

Precautionary statements

Prevention
Avoid breathing mist or vapours.
Use only outdoors or in a well-ventilated area.
Contaminated work clothing must not be allowed out of the workplace.
Wear protective gloves.

Response
IF ON SKIN: Wash with plenty of soap and water.
IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/ doctor if you feel unwell.
If skin irritation or rash occurs: Get medical advice/ attention.
Wash contaminated clothing before reuse.

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

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

Other hazards
No data available

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical nature: Isocyanates
This product is a mixture.

Component	CASRN	Concentration
1,6-diisocyanatohexane, homopolymer	28182-81-2	>= 60.0 - <= 90.0 %
Hexane, 1,6-diisocyanato-, homopolymer, polyethylene-polypropylene glycol mono-Bu ether-blocked	125252-47-3	>= 10.0 - <= 40.0 %
Hexamethylene diisocyanate	822-06-0	<= 0.2 %

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 and keep comfortable for breathing. 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: 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 or rash occurs. Wash clothing before reuse. An MDI skin decontamination study demonstrated that cleaning very soon after exposure is important, and that a polyglycol-based skin cleanser or corn oil may be more effective than soap and water. This may also apply to other isocyanates. Discard items which cannot be decontaminated, including leather articles such as shoes, belts and watchbands. 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: Excessive exposure may aggravate preexisting asthma and other respiratory disorders (e.g. emphysema, bronchitis, reactive airways dysfunction syndrome). Maintain adequate ventilation and oxygenation of the patient. May cause respiratory sensitization or asthma-like symptoms. Bronchodilators, expectorants and antitussives may be of help. Treat bronchospasm with inhaled beta2 agonist and oral or parenteral corticosteroids. Respiratory symptoms, including pulmonary edema, may be delayed. Persons receiving significant exposure should be observed 24-48 hours for signs of respiratory distress. If you are sensitized to diisocyanates, consult your physician regarding working with other respiratory irritants or sensitizers. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

5. FIREFIGHTING MEASURES

Extinguishing media

Suitable extinguishing media: Foam. Carbon dioxide (CO2). Dry powder.

Unsuitable extinguishing media: No data available

Special hazards arising from the substance or mixture

Hazardous combustion products: During a fire, irritating and highly toxic gases and/or fumes may be generated during combustion or decomposition..

Unusual Fire and Explosion Hazards: Do not allow run-off from fire fighting to enter drains or water courses.. Closed containers may explode when heated or contents contaminated with water..

Advice for firefighters

Fire Fighting Procedures: Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.. Collect contaminated fire extinguishing water separately. This must not be discharged into drains..

Special protective equipment for firefighters: In the event of fire, wear self-contained breathing apparatus..

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures: Ventilate the area. Refer to protective measures listed in sections 7 and 8. MATERIAL IS A POTENTIAL SENSITIZER. No conditions to be specially mentioned.

Environmental precautions: Try to prevent the material from entering drains or water courses. Do not contaminate surface water.

Methods and materials for containment and cleaning up: Ventilate the area. Evacuate personnel to safe areas. 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.

7. HANDLING AND STORAGE

Precautions for safe handling: Avoid contact with skin and eyes. For personal protection see section 8. CONTAINERS MAY BE HAZARDOUS WHEN EMPTY. Since emptied containers retain product residue follow all (M)SDS and label warnings even after container is emptied.

Conditions for safe storage: Keep container tightly closed. Store in a cool, dry, well ventilated place.
Other data: This material is a potential skin sensitizer. See SECTION 8, Exposure Controls/Personal Protection, prior to handling.

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

1,6-diisocyanatohexane, homopolymer	Dow IHG	TWA	0.1 mg/m3
	Further information: DSEN, RSEN: Skin and respiratory sensitizer		
	Dow IHG	STEL	0.3 mg/m3
	Further information: DSEN, RSEN: Skin and respiratory sensitizer		
Hexamethylene diisocyanate	Dow IHG	TWA	0.005 ppm
	Further information: DSEN, RSEN: Skin and respiratory sensitizer		
	Dow IHG	TLV-C	0.02 ppm
	Further information: DSEN, RSEN: Skin and respiratory sensitizer		
	ACGIH	TWA	0.005 ppm

Biological occupational exposure limits

Components	CAS-No.	Control parameters	Biological specimen	Sampling time	Permissible concentration	Basis
Hexamethylene diisocyanate	822-06-0	1,6-Hexamethylene diamine	Urine	End of shift	15 µg/g creatinine	ACGIH BEI

Exposure controls

Engineering controls: Use only with adequate ventilation. Local exhaust ventilation may be necessary for some operations. Provide general and/or local exhaust ventilation to control airborne levels below the exposure guidelines. Exhaust systems should be designed to move the air away from the source of vapor/aerosol generation and people working at this point. The odor and irritancy of this material are inadequate to warn of excessive exposure.

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: Polyethylene. Ethyl vinyl alcohol laminate ("EVAL"). Examples of acceptable glove barrier materials include: Butyl rubber. Avoid gloves made of: 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: Atmospheric levels should be maintained below the exposure guideline. When atmospheric levels may exceed the exposure guideline, use an approved air-purifying respirator equipped with an organic vapor sorbent and a particle filter. For situations where the atmospheric levels may exceed the level for which an air-purifying respirator is effective, use a positive-pressure air-supplying respirator (air line or self-contained breathing apparatus). For emergency response or for situations where the atmospheric level is unknown, use an approved positive-pressure self-contained breathing apparatus or positive-pressure air line with auxiliary self-contained air supply.

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 clear
Color	No data available
Odor	mild sweet
Odor Threshold	No data available
pH	Not applicable
Melting point/range	No data available
Freezing point	No data available
Boiling point (760 mmHg)	No data available
Flash point	**closed cup** >194.00 °C (381.20 °F) *SETAFLASH CLOSED CUP*
Evaporation Rate (Butyl Acetate = 1)	No data available
Flammability (solid, gas)	Not Applicable
Lower explosion limit	Not Applicable
Upper explosion limit	Not Applicable
Vapor Pressure	Not applicable
Relative Vapor Density (air = 1)	No data available
Relative Density (water = 1)	No data available
Water solubility	No data available
Partition coefficient: n-octanol/water	No data available
Auto-ignition temperature	No data available
Decomposition temperature	No data available
Dynamic Viscosity	No data available
Kinematic Viscosity	No data available
Explosive properties	No data available
Oxidizing properties	No data available
Molecular weight	No data available
Volatile Organic Compounds	2 g/L

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: Stable under recommended storage conditions. However, keep away from moisture, heat or flame.

Conditions to avoid: None known.

Incompatible materials: Avoid contact with the following: Water Strong acids Strong bases Strong Oxidizers

Hazardous decomposition products: Thermal decomposition may yield the following:. isocyanate monomers. Hydrogen cyanide (hydrocyanic acid).

11. TOXICOLOGICAL INFORMATION

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

Information on likely routes of exposure
Ingestion, Inhalation, Skin contact, Eye contact.

Acute toxicity (represents short term exposures with immediate effects - no chronic/delayed effects known unless otherwise noted)

Acute oral toxicity

Information for the Product:

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.

Based on testing for product(s) in this family of materials:
LD50, Rat, female, > 2,500 mg/kg No deaths occurred at this concentration.

Information for components:

1,6-diisocyanatohexane, homopolymer
LD50, Rat, > 5,000 mg/kg

Hexane, 1,6-diisocyanato-, homopolymer, polyethylene-polypropylene glycol mono-Bu ether-blocked

Single dose oral LD50 has not been determined.

Hexamethylene diisocyanate
LD50, Rat, 710 mg/kg

Acute dermal toxicity

Information for the Product:

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

Based on testing for product(s) in this family of materials:
LD50, Rabbit, male and female, > 2,000 mg/kg No deaths occurred at this concentration.

Information for components:

1,6-diisocyanatohexane, homopolymer
LD50, Rabbit, male and female, > 2,000 mg/kg

Hexane, 1,6-diisocyanato-, homopolymer, polyethylene-polypropylene glycol mono-Bu ether-blocked

The dermal LD50 has not been determined.

Hexamethylene diisocyanate
LD50, Rat, > 7,000 mg/kg

Acute inhalation toxicity

Information for the Product:

Excessive exposure may cause severe irritation to upper respiratory tract (nose and throat) and lungs. Asthma-like symptoms may include coughing, difficult breathing and a feeling of tightness in the chest. Occasionally, breathing difficulties may be life threatening. May cause pulmonary edema (fluid in the lungs.) Effects may be delayed. Decreased lung function has been associated with overexposure to isocyanates.

Based on testing for product(s) in this family of materials:
LC50, Rat, male, 4 Hour, dust/mist, 0.543 mg/l
Based on testing for product(s) in this family of materials:
LC50, Rat, female, 4 Hour, dust/mist, 0.39 mg/l
Information for components:

1,6-diisocyanatohexane, homopolymer
LC50, Rat, male, 4 Hour, dust/mist, 0.543 mg/l

Hexane, 1,6-diisocyanato-, homopolymer, polyethylene-polypropylene glycol mono-Bu ether-blocked

The LC50 has not been determined.

Hexamethylene diisocyanate
LC50, Rat, 4 Hour, vapour, 0.124 mg/l

Skin corrosion/irritation

Information for the Product:

Based on testing for product(s) in this family of materials:
Brief contact may cause slight skin irritation with local redness.
Prolonged contact may cause skin irritation with local redness.

Information for components:

1,6-diisocyanatohexane, homopolymer
Brief contact may cause slight skin irritation with local redness.
Prolonged contact may cause skin irritation with local redness.

Hexane, 1,6-diisocyanato-, homopolymer, polyethylene-polypropylene glycol mono-Bu ether-blocked

Brief contact is essentially nonirritating to skin.

Hexamethylene diisocyanate
Brief contact may cause skin burns. Symptoms may include pain, severe local redness and tissue damage.
Vapor may cause skin irritation.

Serious eye damage/eye irritation

Information for the Product:

Based on testing for product(s) in this family of materials:
May cause eye irritation.

Information for components:

1,6-diisocyanatohexane, homopolymer
May cause eye irritation.

Hexane, 1,6-diisocyanato-, homopolymer, polyethylene-polypropylene glycol mono-Bu ether-blocked

Essentially nonirritating to eyes.
Corneal injury is unlikely.

Hexamethylene diisocyanate
May cause severe irritation with corneal injury which may result in permanent impairment of vision, even blindness. Chemical burns may occur.
Vapor may cause eye irritation experienced as mild discomfort and redness.
Vapor may cause lacrimation (tears).

Sensitization

Information for the Product:

For skin sensitization:
Skin contact may cause an allergic skin reaction.
Hexamethylene diisocyanate is a potent skin sensitizer. Severe skin rash/allergic skin reactions have been noted in people exposed to aerosols/vapors of heated material.

For respiratory sensitization:
Reexposure to extremely low isocyanate concentrations may cause allergic respiratory reactions in individuals already sensitized.

Information for components:

1,6-diisocyanatohexane, homopolymer
Skin contact may cause an allergic skin reaction.
Hexamethylene diisocyanate is a potent skin sensitizer. Severe skin rash/allergic skin reactions have been noted in people exposed to aerosols/vapors of heated material.

No signs of respiratory sensitization have been reported.

Hexane, 1,6-diisocyanato-, homopolymer, polyethylene-polypropylene glycol mono-Bu ether-blocked

For skin sensitization:
No relevant data found.

For respiratory sensitization:
No relevant data found.

Hexamethylene diisocyanate
Has caused allergic skin reactions in humans.
Hexamethylene diisocyanate is a potent skin sensitizer. Severe skin rash/allergic skin reactions have been noted in people exposed to aerosols/vapors of heated material.

May cause allergic respiratory reaction.
Reexposure to extremely low isocyanate concentrations may cause allergic respiratory reactions in individuals already sensitized.

Specific Target Organ Systemic Toxicity (Single Exposure)

Information for the Product:

Product test data not available.

Information for components:

1,6-diisocyanatohexane, homopolymer
May cause respiratory irritation.
Route of Exposure: Inhalation

Hexane, 1,6-diisocyanato-, homopolymer, polyethylene-polypropylene glycol mono-Bu ether-blocked

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

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

Aspiration Hazard

Information for the Product:

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

Information for components:

1,6-diisocyanatohexane, homopolymer
Based on physical properties, not likely to be an aspiration hazard.

Hexane, 1,6-diisocyanato-, homopolymer, polyethylene-polypropylene glycol mono-Bu ether-blocked

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

Hexamethylene diisocyanate
Aspiration into the respiratory system may occur during ingestion or vomiting. Due to corrosivity, tissue damage or lung injury may occur.

Chronic toxicity (represents longer term exposures with repeated dose resulting in chronic/delayed effects - no immediate effects known unless otherwise noted)

Specific Target Organ Systemic Toxicity (Repeated Exposure)

Information for the Product:

Product test data not available.

Information for components:

1,6-diisocyanatohexane, homopolymer
Decreased lung function has been associated with overexposure to isocyanates.

Hexane, 1,6-diisocyanato-, homopolymer, polyethylene-polypropylene glycol mono-Bu ether-blocked

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

Hexamethylene diisocyanate
Excessive exposure may cause severe irritation to upper respiratory tract (nose and throat) and lungs.
Excessive exposure may cause lung injury.
Excessive exposure may produce organophosphate type cholinesterase inhibition.
In animals, effects have been reported on the following organs:
Gastrointestinal tract.

Carcinogenicity

Information for the Product:

Product test data not available.

Information for components:

1,6-diisocyanatohexane, homopolymer
No relevant data found.

Hexane, 1,6-diisocyanato-, homopolymer, polyethylene-polypropylene glycol mono-Bu ether-blocked

No relevant data found.

Hexamethylene diisocyanate

Did not cause cancer in laboratory animals.

Teratogenicity

Information for the Product:

Product test data not available.

Information for components:

1,6-diisocyanatohexane, homopolymer
No relevant information found.

Hexane, 1,6-diisocyanato-, homopolymer, polyethylene-polypropylene glycol mono-Bu ether-blocked

No relevant data found.

Hexamethylene diisocyanate
Did not cause birth defects or other effects in the fetus even at doses which caused toxic effects in the mother. Did not cause birth defects or any other fetal effects in laboratory animals.

Reproductive toxicity

Information for the Product:

Product test data not available.

Information for components:

1,6-diisocyanatohexane, homopolymer
No relevant information found.

Hexane, 1,6-diisocyanato-, homopolymer, polyethylene-polypropylene glycol mono-Bu ether-blocked

No relevant data found.

Hexamethylene diisocyanate
In animal studies, did not interfere with reproduction. In animal studies, did not interfere with fertility.

Mutagenicity

Information for the Product:

Product test data not available.

Information for components:

1,6-diisocyanatohexane, homopolymer
In vitro genetic toxicity studies were negative.

Hexane, 1,6-diisocyanato-, homopolymer, polyethylene-polypropylene glycol mono-Bu ether-blocked

No relevant data found.

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

12. ECOLOGICAL INFORMATION

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

Toxicity

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).

For this family of materials:
NOEC mortality, Danio rerio (zebra fish), static test, 96 Hour, > 100 mg/l, OECD Test Guideline 203 or Equivalent

Acute toxicity to aquatic invertebrates
For this family of materials:
NOEC, Daphnia magna (Water flea), static test, 48 Hour, > 100 mg/l, OECD Test Guideline 202 or Equivalent

Acute toxicity to algae/aquatic plants
For this family of materials:
EC50, alga Scenedesmus sp., static test, 72 Hour, Biomass, > 1,000 mg/l

Toxicity to bacteria
For this family of materials:
EC50, activated sludge, Respiration inhibition, 3 Hour, > 1,000 mg/l, OECD 209 Test

Persistence and degradability

Biodegradability: For this family of materials: In the aquatic and terrestrial environment, material reacts with water forming predominantly insoluble polyureas which appear to be stable. In the atmospheric environment, material is expected to have a short tropospheric half-life, based on calculations and by analogy with related diisocyanates.
10-day Window: Fail
Biodegradation: 1 %
Exposure time: 28 d
Method: Directive 67/548/EEC Annex V, C.4.E.

Bioaccumulative potential

Bioaccumulation: For this family of materials: In the aquatic and terrestrial environment, movement is expected to be limited by its reaction with water forming predominantly insoluble polyureas.

Mobility in soil

No relevant data found.

13. DISPOSAL CONSIDERATIONS

Disposal methods: Incinerate liquid and contaminated solids in accordance with local, state, and federal regulations. (See 40 CFR 268)

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

Not regulated for transport

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
Acute toxicity (any route of exposure)
Respiratory or skin sensitisation
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
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.

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
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
HMIS

Health	Flammability	Physical Hazard
3*	1	1

* = Chronic Effects (See Hazards Identification)

Revision
Identification Number: 10094007 / A001 / Issue Date: 02/18/2022 / Version: 6.0
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)
Dow IHG	Dow Industrial Hygiene Guideline
STEL	Short term exposure limit
TLV-C	Ceiling Limit Value
TWA	Time weighted average

Full text of other abbreviations
AIIC - Australian Inventory of Industrial Chemicals; 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; TECI - Thailand Existing Chemicals 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