



# Material Safety Data Sheet

## 1. PRODUCT AND COMPANY IDENTIFICATION

### ADCOTE (TM) 331

Revision date: 03/16/2009

**Supplier** The Dow Chemical Company  
100 Independence Mall West  
Philadelphia, PA 19106-2399 United States of America

**For non-emergency information contact:** 215-592-3000

#### Emergency telephone

Spill Emergency 215-592-3000  
Health Emergency 215-592-3000  
Chemtrec 800-424-9300

## 2. COMPOSITION/INFORMATION ON INGREDIENTS

Component	CAS-No.	Concentration
Polyurethane resin	Not Hazardous	73.0 - 75.0%
Methylenebis(4-phenyl isocyanate)	101-68-8	0.1 - 0.7%
Propylene Oxide	75-56-9	< 0.06%
Ethyl acetate	141-78-6	25.0 - 27.0%

## 3. HAZARDS IDENTIFICATION

Emergency Overview

Appearance

Form	liquid
Colour	yellow
Odour	Solvent odor

<b>Hazard Summary</b>	<p><b><u>WARNING!</u></b> FLAMMABLE LIQUID AND VAPOR. INHALATION OF VAPOR OR MIST CAN CAUSE THE FOLLOWING: SHORTNESS OF BREATH TIGHTNESS IN THE CHEST IRRITATING TO EYES AND SKIN. MAY CAUSE SENSITIZATION BY INHALATION AND SKIN CONTACT. CLOSED CONTAINERS MAY EXPLODE WHEN HEATED OR CONTENTS CONTAMINATED WITH WATER. PROLONGED OR REPEATED OVEREXPOSURE TO THE SOLVENT(S) IN THIS MATERIAL CAN CAUSE THE FOLLOWING: KIDNEY DAMAGE LIVER DAMAGE HEART DAMAGE CENTRAL NERVOUS SYSTEM (CNS) EFFECTS BLOOD CHANGES LUNG DAMAGE</p>
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Potential Health Effects

<b>Primary Routes of Entry:</b>	Eye contact Inhalation Skin contact
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**Eyes:**Material can cause the following:

- Moderate irritation.
- burning sensation
- tearing
- reddening

**Skin:**May cause sensitization by skin contact.

- Material can cause the following:
- Moderate irritation.

burning sensation  
reddening  
Itching

**Ingestion:**Material can cause the following:  
severe irritation of the mouth, throat, and digestive tract  
diarrhea  
nausea

Vomiting  
Abdominal pain

**Inhalation:**Inhalation of vapor or mist can cause the following:  
coughing  
irritation of nose, throat, and lungs  
tightness in the chest  
Shortness of breath

May cause severe allergic respiratory reaction.  
Sensitisation

**Chronic Exposure:**Long term exposure to diisocyanates may cause lung damage, including reduced lung function, which may be permanent.

Prolonged or repeated overexposure to the solvent(s) in this material can cause the following:

heart damage  
Blood changes  
central nervous system (CNS) effects  
kidney damage  
liver damage  
lung damage

<b>Methylenebis(4-phenyl isocyanate)</b>	IRIS	Not classifiable.
<b>Methylenebis(4-phenyl isocyanate)</b>	IARC	Inadequate data.
<b>Methylenebis(4-phenyl isocyanate)</b>	IARC	No data.
<b>Methylenebis(4-phenyl isocyanate)</b>	IARC	No data.
<b>Methylenebis(4-phenyl isocyanate)</b>	IARC	Classification not possible from current data.
<b>Propylene Oxide</b>	ACGIH	Sensitiser.
<b>Propylene Oxide</b>	ACGIH	Confirmed animal carcinogen with unknown relevance to humans.
<b>Propylene Oxide</b>	US CA CRT	Carcinogenic.
<b>Propylene Oxide</b>	NTP CARC	Anticipated carcinogen.
<b>Propylene Oxide</b>	IARC	Possible carcinogen.

Propylene Oxide	IRIS	Probable human carcinogen - sufficient animal evidence.
Propylene Oxide	NIOSH	Potentially carcinogenic.

## 4. FIRST AID MEASURES

**Inhalation:**Move to fresh air. If breathing is irregular or stopped, administer artificial respiration. Call a physician immediately.

**Skin contact:**Take off all contaminated clothing immediately. Wash off immediately with soap and plenty of water. If skin irritation persists, call a physician. Wash contaminated clothing before re-use.

**Eye contact:**Flush eyes with water as a precaution. If eye irritation persists, consult a specialist.

**Ingestion:**Never give anything by mouth to an unconscious person. If a person vomits when lying on his back, place him in the recovery position. Do NOT induce vomiting. Rinse mouth. Immediately give large quantities of water to drink. Call a physician immediately.

**Notes to physician:**Bronchial constriction may develop after extensive exposure to isocyanates, even in individuals who have not been shown to be previously sensitized.

## 5. FIRE-FIGHTING MEASURES

Flash point	-4 °C ( 24.80 °F ) Tag closed cup
Ignition temperature	426.0 °C ( 798.80 °F ) Ethyl acetate
Lower explosion limit	2.20 %(V)Ethyl acetate
Upper explosion limit	11.50 %(V)Ethyl acetate
Thermal decomposition	Heating or fire conditions liberates toxic gas.
Combustion Products:	Hydrogen Cyanide Carbon monoxide Carbon dioxide Nitrogen oxide (NO2)

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

**Specific hazards during fire fighting:**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.

**Special protective equipment for fire-fighters:**Wear self-contained breathing apparatus and protective suit.

**Further information:**For safety reasons in case of fire, containers should be stored separately in closed containments. Cool closed containers exposed to fire with water spray.

EXPLOSION HAZARD. Fight advanced fires from a protected location.

Collect contaminated fire extinguishing water separately. This must not be discharged into drains.

Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.

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## 6. ACCIDENTAL RELEASE MEASURES

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### Personal precautions

Use personal protective equipment.

Refer to protective measures listed in sections 7 and 8.

MATERIAL IS A POTENTIAL SENSITIZER.

If exposed to material during clean-up operations, IMMEDIATELY remove all contaminated clothing and wash exposed skin areas with soap and water. See SECTION 4, First Aid Measures, for further information.

### Environmental precautions

Do not flush into surface water or sanitary sewer system.

### Methods for cleaning up

Evacuate personnel to safe areas.

Remove all sources of ignition.

Ensure adequate ventilation.

Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13).

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## 7. HANDLING AND STORAGE

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### Handling

Provide sufficient air exchange and/or exhaust in work rooms. Avoid exceeding of the given occupational exposure limits (see section 8).

In case of insufficient ventilation, wear suitable respiratory equipment. Do not breathe vapours or spray mist. Wear personal protective equipment. For personal protection see section 8. Keep away from heat and sources of ignition. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapours). Ensure all equipment is electrically grounded before beginning transfer operations. May cause sensitization of susceptible persons by skin contact. CONTAINERS MAY BE HAZARDOUS WHEN EMPTY. Since emptied containers retain product residue follow all MSDS and label warnings even after container is emptied.

### Storage

**Storage conditions:**Material can burn; limit indoor storage to approved areas equipped with automatic sprinklers. Keep container tightly closed in a dry and well-ventilated place. Keep away from heat and sources of ignition. Electrical installations / working materials must comply with the technological safety standards.

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## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

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### Exposure limit(s)

Exposure limits are listed below, if they exist.

Component	Regulation	Type of listing	Value	
Methylenebis(4-phenyl isocyanate)	Rohm and Haas	TWA	0.005 ppm	
	Rohm and Haas	STEL	0.02 ppm	
	ACGIH	TWA	0.005 ppm	
	NIOSH/GUIDE	REL	0.05 mg/m3	0.005 ppm
	NIOSH/GUIDE	Ceil_Time	0.2 mg/m3	0.020 ppm
	OSHA_TRANS Z1A	Ceiling	0.2 mg/m3	0.02 ppm
		Ceiling	0.2 mg/m3	0.02 ppm

Component	Regulation	Type of listing	Value	
Propylene Oxide	Rohm and Haas	TWA	2 ppm	
	ACGIH	TWA	2 ppm	
	OSHA_TRANS	PEL	240 mg/m3	100 ppm
	Z1A	TWA	50 mg/m3	20 ppm

Component	Regulation	Type of listing	Value	
Ethyl acetate	Rohm and Haas	TWA	150 ppm	
	Rohm and Haas	STEL	300 ppm	
	ACGIH	TWA	400 ppm	
	NIOSH/GUIDE	REL	1,400 mg/m3	400 ppm
	OSHA_TRANS	PEL	1,400 mg/m3	400 ppm
	Z1A	TWA	1,400 mg/m3	400 ppm

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

**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): 4H Glove (Trademark of Safety 4 A/S of Denmark) butyl-rubber Gloves should be removed and replaced immediately if there is any indication of degradation or chemical breakthrough. Before removing gloves clean them with soap and water. NOTE: Material is a possible skin sensitizer.

**Skin and body protection:** Complete suit protecting against chemicals Safety shoes

**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. Above the exposure limit: 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.

**Hygiene measures:** Wash hands before breaks and immediately after handling the product.

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

**Engineering measures:**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.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

### Appearance

Form	liquid
Colour	yellow
Odour	Solvent odor
pH	Not Applicable
Boiling point/boiling range	77 °C ( 170.60 °F ) Ethyl acetate
Flash point	-4 °C ( 24.80 °F ) Tag closed cup
Ignition temperature	426 °C ( 798.80 °F ) Ethyl acetate
Lower explosion limit	2.20 %(V)Ethyl acetate
Upper explosion limit	11.50 %(V)Ethyl acetate
Vapour pressure	97.3333 mmHg at 20 °C ( 68.00 °F ) Ethyl acetate
Vapour pressure	at 20 °C ( 68.00 °F ) Ethyl acetate
Relative vapour density	3.0Ethyl acetate
Water solubility	insoluble
Relative density	1.05
Evaporation rate	6.20 Ethyl acetate
Percent volatility	24 - 27 %

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

## 10. STABILITY AND REACTIVITY

Hazardous reactions	Stable under recommended storage conditions. Avoid moisture.
Conditions to avoid	Heat, flames and sparks. Exposure to water vapour.

**Materials to avoid**

Strong oxidizing agents    Water

**Hazardous decomposition products**Hydrogen Cyanide  
Acetaldehyde  
Isocyanate(s)**polymerisation**Hazardous polymerization will also occur if contaminated with the following:  
- water (moisture)

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## 11. TOXICOLOGICAL INFORMATION

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No toxicity data are available for this material.

Component: **Methylenebis(4-phenyl isocyanate)****Acute oral toxicity**            LD50 rat    31,600 mg/kgComponent: **Ethyl acetate****Acute oral toxicity**            LD50 human    6,100 mg/kgComponent: **Ethyl acetate****Acute oral toxicity**            LD50 rat    5,620 mg/kgComponent: **Methylenebis(4-phenyl isocyanate)****Acute inhalation toxicity**    LC50 rat male 4.0 h 369 mg/m<sup>3</sup>Component: **Methylenebis(4-phenyl isocyanate)****Acute inhalation toxicity**    LC50 rat    1 h 2.24 mg/lComponent: **Methylenebis(4-phenyl isocyanate)****Acute inhalation toxicity**    LC50 rat female 4 h 380 mg/m<sup>3</sup>Component: **Methylenebis(4-phenyl isocyanate)****Acute dermal toxicity**            LD50 rabbit    > 9,400 mg/kgComponent: **Methylenebis(4-phenyl isocyanate)****Sensitisation**                    Skin and respiratory sensitizerComponent: **Ethyl acetate****Mutagenicity**

Overall, no consistent mutagenic activity has been reported.

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## 12. ECOLOGICAL INFORMATION

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There is no data available for this product.

**Ethyl acetate**

**Ecotoxicity effects**

<b>Toxicity to fish</b>	LC50 Rainbow trout (Oncorhynchus mykiss) 96 h 484 mg/l
<b>Toxicity to fish</b>	LC50 Fathead minnow (Pimephales promelas) 96 h 230 mg/l
<b>Toxicity to algae</b>	EC50 Algae 96 h 2,000 mg/l
<b>Toxicity to aquatic invertebrates</b>	EC50 Daphnia magna 48 h 717 mg/l

**13. DISPOSAL CONSIDERATIONS**

**Environmental precautions:**Do not flush into surface water or sanitary sewer system.

**Disposal**

**Waste Classification:**40 CFR 261.20 - .24 - Characteristic Waste D001, 100 lbs.

When a decision is made to discard this material as supplied, it is classified as a RCRA hazardous waste with the characteristic of ignitability.

For disposal, incinerate this material at a facility that complies with local, state, and federal regulations. (See 40 CFR 268)

**14. TRANSPORT INFORMATION**

**DOT**

<b>Proper shipping name</b>	Resin solution
<b>UN-Number</b>	UN 1866
<b>Class</b>	3
<b>Packing group</b>	II
<b>Reportable Quantity</b>	Ethyl acetate

**IMO/IMDG**

<b>Proper shipping name</b>	Resin solution
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UN-Number	UN 1866
Class	3
Packing group	II

Transportation classifications may vary by container volume and may be influenced by regional or country variations in regulations

## 15. REGULATORY INFORMATION

### Workplace Classification

This product is considered hazardous under the OSHA Hazard Communication Standard (29 CFR 1910.1200).

This product is a 'controlled product' under the Canadian Workplace Hazardous Materials Information System (WHMIS).

### SARA TITLE III:Section 311/312 Categorizations (40CFR370):Fire Hazard

Acute Health Hazard

Chronic Health Hazard

### SARA TITLE III:Section 313 Information (40CFR372)

This product does not contain a chemical which is listed in Section 313 at or above de minimis concentrations.

### CERCLAInformation(40CFR302.4)

See Section 13, Disposal Considerations, Subsection Disposal, for CERCLA classification.

Releases of this material to air, land, or water are not reportable to the National Response Center under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) or to state and local emergency planning committees under the Superfund Amendments and Reauthorization Act (SARA) Title III Section 304.

D001, 100 lbs.

**US. Toxic Substances Control Act (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.

### 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.

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

Components:	Propylene Oxide	75-56-9
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### California (Proposition 65)

This product contains trace levels of a component or components known to the state of California to cause cancer:

Components:	Propylene Oxide	75-56-9
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## 16. OTHER INFORMATION

### Hazard Rating

	Health	Fire	Reactivity
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HMIS	2*	3	0
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HMIS: \* = Chronic Effects (See Hazards Identification)

## Legend

ACGIH	American Conference of Governmental Industrial Hygienists
BAC	Butyl acetate
OSHA	Occupational Safety and Health Administration
PEL	Permissible Exposure Limit
STEL	Short Term Exposure Limit (STEL):
TLV	Threshold Limit Value
TWA	Time Weighted Average (TWA):
	Bar denotes a revision from prior MSDS.

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

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