

MSDS ID: 8026968

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1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

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PRODUCT PART NUMBER: 8026968  
DESCRIPTION: 4496 WHITE

COMPANY:  
Markem Corporation  
150 Congress Street  
Keene, NH 03431

EMERGENCY RESPONSE NUMBERS:  
Transportation:  
United States: (800) 424-9300  
International: (703) 527-3887(collect)  
Product Safety and Environmental:  
(603) 352-1130

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2. HAZARDOUS INGREDIENTS

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COMPONENT	CAS #	PCT(WT)
N-butyl acetate	123-86-4	5-10
Blocked hexamethylene diisocyanate polymer	153519-43-8	10-30
Cyclohexanone	108-94-1	0.1-1
Diethylene glycol ethyl ether acetate	112-15-2	1-5
Diethylene glycol monobutyl ether	112-34-5	1-5
Kaolin, aluminum silicate	1332-58-7	1-5
N-butyl acetate	123-86-4	5-10
Petroleum naphtha light aromatic	64742-95-6	0.1-1
Propylene glycol monomethyl ether acetate	108-65-6	5-10
2-butoxyethanol acetate	112-07-2	1-5

Exposure and physical property information is presented in Section 9. If the total percentage is less than 100, the balance of this product is not considered to be hazardous as defined in the OSHA Hazard Communication Standard (29 CFR 1910.1200).

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3. HAZARDS IDENTIFICATION

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EMERGENCY OVERVIEW

HMIS RATING SYSTEM  
Health: 3  
Flammability: 3  
Reactivity: 1  
Protection: B

NFPA RATING SYSTEM  
Health: 3  
Flammability: 3  
Reactivity: 1

POTENTIAL HEALTH CONSIDERATIONS

LIKELY ROUTES OF ENTRY:  
Contact; Inhalation; Absorption; Ingestion

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### 3. HAZARDS IDENTIFICATION (Cont.)

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#### TARGET ORGANS:

Respiratory Tract; Eyes; Skin; Liver; Kidneys; Nervous System; Lungs;  
Digestive Tract; Blood;

#### POTENTIAL IMMEDIATE EFFECTS FROM OVEREXPOSURE

##### EYE CONTACT

Can cause severe eye irritation, tearing and reddening, but not likely to permanently injure eye tissue. Temporary vision impairment (cloudy or blurred vision) is possible.

##### SKIN CONTACT

Can cause severe skin irritation, defatting, and dermatitis. Not likely to cause permanent skin damage.  
Skin Sensitizer! Avoid exposure. If sensitized, repeated exposures will result in skin irritation, even at very low concentrations.

##### SKIN ABSORPTION

Toxic if absorbed through the skin causing systemic damage.

##### INHALATION

Toxic by inhalation, can cause severe irritation or burns, pulmonary edema or lung inflammation. Central nervous system effects such as dizziness, weakness, fatigue, nausea, headache, unconsciousness and even asphyxiation are possible. High concentrations in immediate area can displace oxygen and can cause dizziness, unconsciousness and even death with longer exposure.  
Vapors and/or aerosols which may be formed at elevated temperatures may be irritating to the respiratory tract.  
Respiratory Sensitizer! Avoid exposure. If sensitized, repeated exposures will result in respiratory irritation and shortness of breath, even at very low concentrations. These asthma-type symptoms may develop immediately or be delayed up to several hours.

##### INGESTION

Toxic. If swallowed, may cause abdominal discomfort, nausea, vomiting, diarrhea and systemic poisoning.  
Aspiration of material into the lungs can cause chemical pneumonitis which can be fatal.

#### POTENTIAL LONG-TERM EFFECTS FROM OVEREXPOSURE:

##### CANCER INFORMATION

Contains a substance that can cause cancer in laboratory animals at high oral doses. Not a carcinogen according to NTP, IARC, or OSHA.  
No IARC cancer hazard information available.  
No ACGIH cancer hazard information available.  
No NTP cancer hazard information available.  
No OSHA cancer hazard information available.

##### REPRODUCTIVE SYSTEM INFORMATION

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### 3. HAZARDS IDENTIFICATION (Cont.)

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Contains a substance that is a possible reproductive hazard based on tests with laboratory animals.

#### ADDITIONAL HEALTH HAZARD INFORMATION

Butyl acetate: Throat irritation has been noted in human subjects at 200ppm. Diglycol ethers may cause acidosis. Preexisting disorders of the liver, lungs, kidney, or blood-forming system may be aggravated by exposure to this material.

#### MEDICAL CONDITIONS POTENTIALLY AGGRAVATED BY OVEREXPOSURE

Skin disease including eczema and sensitization, Liver disease, Kidney disease,

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### 4. FIRST AID MEASURES

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#### EYE CONTACT

Immediately flush eyes with plenty of water for at least 20 minutes retracting eyelids often. Get immediate medical attention.

#### SKIN CONTACT

Wash skin with soap and water. Immediately remove contaminated clothing and get medical attention. Launder or discard contaminated clothing at once.

#### INHALATION

Remove to fresh air. If not breathing, perform rescue breathing and, if available, have a trained person administer oxygen. Get medical attention immediately.

#### INGESTION

Emergency personnel should be contacted immediately and be provided with this MSDS. For ingestion of small quantities of chemicals, the risk associated with inducing vomiting usually exceeds the poisoning risk.

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### 5. FIRE FIGHTING MEASURES

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#### FLAMMABILITY DATA

FLASH POINT: 92 F, 33 C

EXPLOSIVE/FLAMMABILITY LIMITS ESTIMATED FROM INGREDIENTS:

LOWER LIMIT: 0.9 %

UPPER LIMIT: 24.6 %

AUTOIGNITION TEMPERATURE ESTIMATED FROM INGREDIENTS:

400 F, 204 C

#### GENERAL HAZARDS

Vapors may be ignited by heat, sparks, flames or other sources of ignition giving rise to a Class B fire. Vapors are heavier than air and may travel to a source of ignition and flash back. Container may explode in heat of fire. Empty container may still contain residual material that can ignite and/or result in an explosion. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty container to heat, flame, sparks, static electricity, or other sources of ignition.

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## 5. FIRE FIGHTING MEASURES (Cont.)

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### EXTINGUISHING MEDIA

Small Fires: Dry chemical, CO<sub>2</sub>, water spray or alcohol-resistant foam. Large Fires: Water spray, fog or alcohol-resistant foam. Move containers from fire area if it can be done without risk. Apply cooling water to containers that are exposed to flames until well after fire is out.

### FIRE FIGHTING INSTRUCTIONS

Do not enter fire area without proper protection including self-contained breathing apparatus and full protective equipment. Fight fire from a safe distance and a protected location. Heat may build pressure and rupture closed containers, spreading fire and increasing risk of burns or injuries. Water may be ineffective in firefighting due to low flash point and limited miscibility with water. Flammable/combustible components of this material may be lighter than water and burn while floating on the surface. Use water spray/fog for cooling. Even if material is water soluble, it may not be practical to extinguish fire by water dilution. Notify authorities if liquid enters sewers or other public waters.

### HAZARDOUS COMBUSTION PRODUCTS

carbon monoxide; hydrogen cyanide; nitrogen containing gases; carbon dioxide; aliphatic aldehydes

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## 6. ACCIDENTAL RELEASE MEASURES

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### SPILL CLEAN-UP PROCEDURES

Shut off ignition sources; smoking, flames or other sources of ignition must not be permitted in the area. Small Spills: Take up with sand or other noncombustible absorbent material and put into properly labeled containers for disposal. Large Spills: Dike ahead of liquid spill area to minimize migration and vapor generation. Ventilate the area. Get professional help from outside contractors, the fire department or your trained spill brigade.

### HEALTH CONSIDERATIONS AND PROTECTIVE EQUIPMENT

Information on the selection and use of personal protective equipment is found in Section 8 of this MSDS. Personal protective equipment needs must be evaluated based on information provided on this sheet and the special circumstances created by the spill including; material spilled, quantity, the area in which it occurred and the expertise of employees in the area responding to the spill. Never exceed any occupational exposure limits and consider that the evaporation of volatile solvents can lead to the displacement of air creating an environment that can cause asphyxiation.

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## 7. HANDLING AND STORAGE

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### HANDLING

Avoid contact with material, avoid breathing vapors, use only in a well ventilated area, use bonding and grounding when transferring this material.

### STORAGE

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## 7. HANDLING AND STORAGE (Cont.)

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Store in a cool dry ventilated location, away from oxidizers, heat, flame or other incompatible conditions. Keep container(s) closed if possible. Prevent contact with moisture

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## 8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

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### ENGINEERING CONTROLS

Local exhaust ventilation or other engineering controls may be needed when handling or using this product to keep exposure to airborne contaminants below the exposure limit. These controls should be explosion-proof when exhausting flammable vapors.

### RESPIRATORY PROTECTION

If air monitoring indicates airborne concentrations at or above the limits, or symptoms of inhalation over-exposure occur, a respiratory protection program may be required. Engineering controls to reduce the exposure below acceptable limits are usually preferable to a respirator program. Use engineering or administrative controls to minimize exposure in preference to using respirators. Protection provided by air purifying respirators is limited. Use a positive pressure air supplied respiratory if there is any potential for an uncontrolled release, exposure levels are not known, the work atmosphere may be deficient of oxygen, or any other circumstances where air purifying respirators may not provide adequate protection.

### EYE PROTECTION

Chemically resistant safety glasses with side shields must be worn when handling this product. Further eye protection such as chemical splash goggles and/or face shield must be worn when the possibility exists for eye contact due to splashing or spraying liquid or airborne particles. Contact lenses should not be worn. An eye wash station should be available.

### SKIN PROTECTION

Wear protective gloves and apron. Depending upon conditions of use other equipment may be required. Inspect gloves for chemical break-through and replace as required. Clean equipment after each use. An emergency eye wash in the area is recommended. Appropriate gloves to be used for MARKEM products that are mixtures have not been determined. Glove type(s) for ingredients present at 10% or more (if known) are:  
No information available

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## 9. PHYSICAL AND CHEMICAL PROPERTIES - PRODUCT

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APPEARANCE:	Liquid
COLOR:	White
ODOR:	Strong solvent
SPECIFIC GRAVITY(g/ml):	1.51
PERCENT VOLATILE:	27
VOC CONTENT(lb/gal):	Not determined
VAPOR PRESSURE (Pa):	Not determined
BOILING PT OR RANGE(F):	ND
pH:	NA

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 9. PHYSICAL AND CHEMICAL PROPERTIES - PRODUCT (Cont.)
 

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VISCOSITY: ND  
 VAPOR DENSITY: Heavier than air  
 FREEZING POINT(F): ND  
 EVAPORATION RATE: 0.5-2 (n-Butyl acetate = 1)

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 9.1 EXPOSURE, PHYSICAL AND CHEMICAL PROPERTIES FOR COMPONENTS
 

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COMPONENT	ACGIH		OSHA	
	TWA\CEIL	STEL	TWA	CEIL
123-86-4	150 ppm	200 ppm	150 ppm	NE
153519-43-8	NE	NE	NE	NE
108-94-1	25 ppm	NE	50 ppm	NE
112-15-2	NE	NE	NE	NE
112-34-5	NE	NE	NE	NE
1332-58-7	2 mg/m3	NE	10 mg/m3	NE
123-86-4	150 ppm	200 ppm	150 ppm	NE
64742-95-6	NE	NE	NE	NE
108-65-6	NE	NE	NE	NE
112-07-2	20 ppm	NE	NE	NE

COMPONENT CAS NUMBER	SPECIFIC GRAVITY	EVAP RATE N-BUTYL ACETATE=1	WATER SOLUBILITY Weight %	VAPOR PRESSURE mmHg at F
123-86-4	0.883	0.5-2	Minimal;	1-8.4 @ 20
153519-43-8	1.000	ND	ND	<0.0075
108-94-1	0.946	0.1-0.5	Minimal;	1-3.2 mmHg @ 20°C
112-15-2	1.010	ND	Complete;	1ND
112-34-5	0.954	0.01-0.1	Complete;	10.02
1332-58-7	2.500	ND	ND	ND
123-86-4	0.883	0.5-2	Minimal;	1-8.4 @ 20
64742-95-6	0.750	ND	ND	ND
108-65-6	0.964	ND	Low;	10-24%3.7
112-07-2	0.942	0.01-0.1	Minimal;	1-0.25

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 10. STABILITY AND REACTIVITY
 

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## STABILITY

May become unstable at elevated temperatures and/or pressure.

## CONDITIONS TO AVOID

Heat, sparks, open flame, other ignition sources, oxidizing conditions, and elevated temperatures.

## INCOMPATIBILITY

caustics (bases); strong oxidizing agents; water; acids

## HAZARDOUS DECOMPOSITION PRODUCTS

carbon monoxide; hydrogen cyanide; nitrogen containing gases; carbon dioxide; aliphatic aldehydes

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## 10. STABILITY AND REACTIVITY (Cont.)

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## 11. TOXICOLOGICAL INFORMATION

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### n-Butyl acetate:

LC50 (inhalation, rat): 2000 ppm (4-hour exposure).

LC50 (inhalation, mouse): 6000 mg/m<sup>3</sup> (1260 ppm) (2-hour exposure).

LD50 (oral, rat): 13100 mg/kg.

LD50 (oral, mouse): 7060 mg/kg.

LD50 (oral, rabbit): 7400 mg/kg.

LD50 (oral, guinea pig): 4700 mg/kg.

LD50 (dermal, rabbit): Greater than 5000 mg/kg.

### TERATOGENICITY AND EMBRYOTOXICITY:

Rats exposed to 1500 ppm, 7 hours/day on days 1-16 of pregnancy showed signs of maternal toxicity and fetal toxicity (retarded growth).

### Blocked homopolymer of hexamethylene diisocyanate:

This product contains a blocked isocyanate which is essentially unreactive at room temperature. Free isocyanate may be released if this product is heated to 50°C (122°F). If free isocyanate is inhaled it may cause respiratory conditions with asthmatic and pneumonitis-like symptoms. Respiratory sensitization can occur with similar symptoms.

### Cyclohexanone:

LD50 (rat, oral): 1535 mg/kg

LD50 (rat, oral): 1620 mg/kg

LD50 (rat, oral): 1840 mg/kg

LD50 (mouse, oral): 1400 mg/kg

LD50 (rabbit, percutaneous): 1000 mg/kg

LC50 (rat, inhalation): 8000 ppm (duration of exposure: 4 hr)

### Diethylene glycol ethyl ether acetate

Oral LD50 rat: 11 gm/kg

### Diethylene glycol monobutyl ether:

LD50 (oral, rat): 6,560 mg/kg.

LD50 (oral, rat): 5,660 mg/kg.

LD50 (oral, guinea pig): 2,000 mg/kg

LD50 (oral, rabbit): 2,200 mg/kg.

### Ethylene glycol monobutyl ether acetate:

Oral LD50 rat: 2400 mg/kg, Effect: Kidney, Ureter, Bladder  
(Hematuria; Other changes in urine composition)

### Ethylene glycol monoethyl ether acetate:

LD50 (rat, male, oral): 3,900 ml/kg.

LD50 (rat, female, oral): 2,900 mg/kg.

LD50 (guinea pig, oral): 1,910 mg/kg.

LCLO (rat, inhalation): 1,500 ppm; 8 hours duration of exposure.

### Propylene glycol monomethyl ether acetate:

A single dose of 3 mL/kg produced no deaths;

10 mL/kg caused death in 3 of 5 animals tested.

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## 12. ECOLOGICAL INFORMATION

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Butyl acetate:

LC50 Pimephales promelas (fathead minnow): 18 mg/l/96 hr ,  
LC50 Lepomis macrochirus (Bluegill): 100 ppm/96 hr at 23 deg C.

LC50 Menidia peninsulae (tidewater silverside): 185 ppm/96 hr

If released to soil, n-butyl acetate may be susceptible to significant biodegradation based on its demonstrated biodegradability with a screening test. Chemical hydrolysis in moist alkaline soils (pH approaching 9 or higher) is expected to be important. Volatilization from dry soil surfaces is likely to rapid.

If released to water, biodegradation and volatilization are expected to be the important removal mechanisms. BOD studies using either a sewage inoculum or a natural river-water inoculum have demonstrated that n-butyl acetate is significantly biodegradable.

If released to air, the dominant removal mechanism will be the vapor-phase reaction with photochemically produced hydroxyl radicals which has an estimated half-life of about 6 days in an average atmosphere.

Diethylene glycol monobutyl ether:

LC50 Goldfish 2700 mg/l/24 hr.

Aqueous screening test data indicate that biodegradation may be an important removal mechanism of diethylene glycol monobutyl ether from aerobic soil and water. In the atmosphere, diethylene glycol monobutyl ether is expected to exist almost entirely in the vapor phase and reactions with photochemically produced hydroxyl radicals should be important (estimated half-life of 11 hrs)

Ethylene glycol monobutyl ether acetate:

If released to the atmosphere, it will degrade primarily by reaction with photochemically produced hydroxyl radicals (estimated half-life of 11.8 hr).

If released to soil or water, ethylene glycol monobutyl ether acetate is expected to degrade via biodegradation.

It may leach readily in soils.

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## 13. DISPOSAL CONSIDERATIONS

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Dispose of in accordance with all federal, state, local or provincial regulations.

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## 14. TRANSPORT INFORMATION, DOT and IATA:

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DOT: PRINTING INK, 3, UN1210, PG III

IATA: PRINTING INK RELATED MATERIAL, 3, UN1210, PG III,

LABEL REQUIRED: FLAMMABLE LIQUID

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## 15. REGULATORY INFORMATION

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Those ingredients appearing on the following list that do not appear in Section 2 are present at <0.1% for carcinogens, <1% for other hazardous substances, or are not considered hazardous in this product.

UNITED STATES OF AMERICA

FEDERAL REGULATIONS

CERCLA: The following components have CERCLA reportable quantities:

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15. REGULATORY INFORMATION (Cont.)

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CASRN	DESCRIPTION	CERCLA RQ	WEIGHT%
123-86-4	BUTYL ACETATE	5000 lb final RQ; 2270 kg final RQ	9

RCRA: The following components are subject to RCRA land disposal restrictions:

CASRN	DESCRIPTION
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None

SARA TITLE III

SECTION 302 Extremely Hazardous Substances (EHS)

CASRN	DESCRIPTION
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None

SECTION 311/312 Community Right to Know

CASRN	DESCRIPTION
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None

SARA HAZARD CATEGORY INFORMATION

FIRE: YES

SUDDEN RELEASE OF PRESSURE: NO

REACTIVE: NO

IMMEDIATE (ACUTE) HEALTH HAZARD: NO

DELAYED (CHRONIC) HEALTH HAZARD: NO

SECTION 313 Toxic Chemical Release Inventory Reporting (TRI)

CASRN	DESCRIPTION
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None

TSCA

SECTION 8(b) Inventory: All chemicals in this product appear in the inventory or are exempt from the listing requirements.

SECTION 12(b) Export: The following chemicals are subject to export reporting

CASRN	DESCRIPTION
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123-86-4 N-BUTYL ACETATE

112-34-5 DIETHYLENE GLYCOL MONOBUTYL ETHER

STATE REGULATIONS

CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65)

The following chemical(s) in this product are known to the State of California to cause cancer:

CASRN	DESCRIPTION	WGT%
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71-43-2 BENZENE

<0.001

The following chemical(s) in this product are known to the State of California to be hazards to reproductive health:

CASRN	DESCRIPTION	WGT%
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71-43-2 BENZENE

<0.001

MASSACHUSETTS Right to Know Law

CASRN	DESCRIPTION	%
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123-86-4 BUTYL ACETATE

5-10

1332-58-7 KAOLIN DUST

1-5

NEW JERSEY Right to Know Law

CASRN	DESCRIPTION	%
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123-86-4 N-BUTYL ACETATE

5-10

112-34-5 DIETHYLENE GLYCOL MONOBUTYL ETHER

1-5

PENNSYLVANIA Right to Know Law

CASRN	DESCRIPTION	%
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123-86-4 ACETIC ACID, BUTYL ESTER

5-10

112-34-5 DIETHYLENE GLYCOL MONOBUTYL ETHER

1-5

1332-58-7 KAOLIN

1-5

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15. REGULATORY INFORMATION (Cont.)

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16. OTHER INFORMATION

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Diethylene glycol monobutyl ether: Supplier recommended exposure limit - 35 ppm (TWA)

Note: A CAS number in the form TSXXXX-XX-X is a trade secret.

NA= Not applicable

ND= Not determined

TS= Trade secret

MSDS prepared by Richard C. Berry

This information is offered in good faith as typical values and not as product specifications. No warranty, either expressed or implied, is made. The recommended industrial hygiene and safe handling practices are believed to be generally applicable, however each user must review the recommendations and determine the suitability for their intended use.