

MATERIAL SAFETY DATA SHEET



Bayer MaterialScience

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Product Safety & Regulatory Affairs
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USA

TRANSPORTATION EMERGENCY

CALL CHEMTREC: (800) 424-9300
For TDI Products, call CANUTEC: (613) 996-6666

NON-TRANSPORTATION

Emergency Phone, call CHEMTREC: Call Chemtrec
Information Phone: (800) 662-2927

1. Product and Company Identification

Product Name: ECOBAY OC CAN ISO
Material Number: 84257347
Chemical Family: Aromatic Isocyanate
Chemical Name: Polymeric Diphenylmethane Diisocyanate (pMDI)
Product Use: Refer to technical literature.

2. Hazards Identification

Emergency Overview

Warning

Toxic gases/fumes may be given off during burning or thermal decomposition. Closed container may forcibly rupture under extreme heat or when contents have been contaminated with water. Use cold water spray to cool fire-exposed containers to minimize the risk of rupture. Causes respiratory tract irritation. May cause allergic respiratory reaction. Harmful if inhaled. Respiratory sensitizer. Lung damage and respiratory sensitization may be permanent. When this product is sprayed, a full-face or hood-type supplied air respirator is required. Causes skin irritation. May cause allergic skin reaction. Skin sensitizer. Animal tests and other research indicate that skin contact with MDI can play a role in causing isocyanate sensitization and respiratory reaction. Causes eye irritation. May cause lung damage.

Potential Health Effects

Primary Routes of Entry: Inhalation, Eye Contact, Skin Contact

Medical Conditions Aggravated by Exposure: Asthma, Respiratory disorders, Skin Allergies, Eczema

HUMAN EFFECTS AND SYMPTOMS OF OVEREXPOSURE

Inhalation

Acute Inhalation

For Product: ECOBAY OC CAN ISO

Diisocyanate vapors or mist at concentrations above the TLV or PEL can irritate (burning sensation) the mucous membranes in the respiratory tract (nose, throat, lungs) causing runny nose, sore throat, coughing, chest discomfort, shortness of breath and reduced lung function (breathing obstruction). Persons with a preexisting, nonspecific bronchial hyperreactivity can respond to concentrations below the TLV or PEL

with similar symptoms as well as asthma attack or asthma-like symptoms. Exposure well above the TLV or PEL may lead to bronchitis, bronchial spasm and pulmonary edema (fluid in lungs). Chemical or hypersensitivity pneumonitis, with flu-like symptoms (e.g., fever, chills), has also been reported. These symptoms can be delayed up to several hours after exposure. These effects are usually reversible.

Chronic Inhalation

For Product: ECOBAY OC CAN ISO

As a result of previous repeated overexposures or a single large dose, certain individuals may develop sensitization to diisocyanates (asthma or asthma-like symptoms) that may cause them to react to a later exposure to diisocyanates at levels well below the TLV or PEL. These symptoms, which can include chest tightness, wheezing, cough, shortness of breath or asthmatic attack, could be immediate or delayed up to several hours after exposure. Extreme asthmatic reactions can be life threatening. Similar to many non-specific asthmatic responses, there are reports that once sensitized an individual can experience these symptoms upon exposure to dust, cold air or other irritants. This increased lung sensitivity can persist for weeks and in severe cases for several years. Sensitization can be permanent. Chronic overexposure to diisocyanates has also been reported to cause lung damage (including fibrosis, decrease in lung function) that may be permanent.

Skin

Acute Skin

For Product: ECOBAY OC CAN ISO

Causes skin irritation with symptoms of reddening, itching, and swelling. Persons previously sensitized can experience allergic skin reaction with symptoms of reddening, itching, swelling, and rash. Cured material is difficult to remove. Contact with MDI can cause discoloration.

Chronic Skin

For Product: ECOBAY OC CAN ISO

Prolonged contact can cause reddening, swelling, rash, and, in some cases, skin sensitization. Animal tests and other research indicate that skin contact with MDI can play a role in causing isocyanate sensitization and respiratory reaction. This data reinforces the need to prevent direct skin contact with isocyanates.

Eye

Acute Eye

For Product: ECOBAY OC CAN ISO

Causes irritation with symptoms of reddening, tearing, stinging, and swelling. May cause temporary corneal injury. Vapor or aerosol may cause irritation with symptoms of burning and tearing.

Chronic Eye

For Product: ECOBAY OC CAN ISO

Prolonged vapor contact may cause conjunctivitis.

Ingestion

Acute Ingestion

For Product: ECOBAY OC CAN ISO

May cause irritation; Symptoms may include abdominal pain, nausea, vomiting, and diarrhea.

Carcinogenicity:

No carcinogenic substances as defined by IARC, NTP and/or ACGIH.

3. Composition/Information on Ingredients

Hazardous components

<u>Weight percent</u>	<u>Components</u>	<u>CAS-No.</u>
40 - 70%	Polymeric Diphenylmethane Diisocyanate (pMDI)	9016-87-9
30 - 60%	4,4'-Diphenylmethane Diisocyanate (MDI)	101-68-8
1 - 5%	2,4'-Diphenylmethane Diisocyanate (MDI)	5873-54-1

4. First aid measures

Eye contact

In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Use lukewarm water if possible. Use fingers to ensure that eyelids are separated and that the eye is being irrigated. Call a physician immediately.

Skin contact

Immediately remove contaminated clothing and shoes. Wash off with soap and water. Use lukewarm water if possible. Wash contaminated clothing before reuse. For severe exposures, immediately get under safety shower and begin rinsing. Get medical attention if irritation develops.

Inhalation

Move to an area free from further exposure. Get medical attention immediately. Administer oxygen or artificial respiration as needed. Asthmatic symptoms may develop and may be immediate or delayed up to several hours. Extreme asthmatic reactions can be life threatening.

Ingestion

Do NOT induce vomiting. Wash mouth out with water. Do not give anything by mouth to an unconscious person. Get medical attention.

Notes to physician

Eyes: Stain for evidence of corneal injury. If cornea is burned, instill antibiotic/steroid preparation as needed. Workplace vapors could produce reversible corneal epithelial edema impairing vision. Skin: This compound is a skin sensitizer. Treat symptomatically as for contact dermatitis or thermal burn. Ingestion: Treat symptomatically. There is no specific antidote. Inducing vomiting is contraindicated because of the irritating nature of the compound. Inhalation: Treatment is essentially symptomatic. An individual having a dermal or pulmonary sensitization reaction to this material should be removed from further exposure to any diisocyanate.

5. Firefighting measures

Conditions of Flammability Not Available

Suitable extinguishing media: Dry chemical, Carbon dioxide (CO₂), Foam, water spray for large fires.

Unsuitable extinguishing media Not Available

Special Fire Fighting Procedures

Firefighters should wear NFPA compliant structural firefighting protective equipment, including self-contained breathing apparatus and NFPA compliant helmet, hood, boots and gloves. Avoid contact with product. Decontaminate equipment and protective clothing prior to reuse. During a fire, isocyanate vapors and other irritating, highly toxic gases may be generated by thermal decomposition or combustion. Exposure to heated diisocyanate can be extremely dangerous.

Unusual Fire/Explosion Hazards

Closed container may forcibly rupture under extreme heat or when contents are contaminated with water (CO₂ formed). Use cold-water spray to cool fire-exposed containers to minimize the risk of rupture. Large fires can be extinguished with large volumes of water applied from a safe distance, since reaction between water and hot diisocyanate can be vigorous. The reaction of this product with a polyol system ("B" side) will release heat (e.g., it is an exothermic reaction). Thus, spraying foam too thickly in a single lift, or not allowing sufficient time between lifts, can result in excessive heat generation to the point where the foam may char, smolder or burn. Refer to the appropriate BaySystems technical datasheet for application instructions.

Flash point: 198.89 °C (390 °F) (Pensky-Martens Closed Cup (ASTM D-93))

Lower Flammable Limit Not Available

Upper Flammable Limit Not Available

Auto-ignition temperature Not Available

Hazardous Combustion Products

By Fire and High Heat: Carbon dioxide (CO₂), carbon monoxide (CO), oxides of nitrogen (NO_x), dense black smoke., Isocyanate, Isocyanic Acid, Other undetermined compounds

Sensitivity to Static Discharge Not Available

6. Accidental release measures

Spill and Leak Procedures

Evacuate non-emergency personnel. Isolate the area and prevent access. Remove ignition sources. Notify management. Put on protective equipment. Control source of the leak. Ventilate. Contain the spill to prevent spread into drains, sewers, water supplies, or soil. Call Bayer for assistance and advice. Major Spill or Leak (Standing liquid): Released material may be pumped into closed, but not sealed, metal container for disposal. Process can generate heat. Minor Spill or Leak (Wet surface): Cover spill area with suitable absorbent material (Kitty Litter, Oil-Dri®, etc). Saturate absorbent material with neutralization solution and mix. Wait 15 minutes. Collect material in open-head metal containers. Repeat applications of decontamination solution, with scrubbing, followed by absorbent until the surface is decontaminated. Check for residual surface contamination. Swype® test kits have been used for this purpose. Apply lid loosely and allow containers to vent for 72 hours to let carbon dioxide (CO₂) escape.

Additional Spill Procedures/Neutralization

Products or product mixtures that have been shown to be effective neutralization solutions for decontaminating surfaces, tools, or equipment that have been in contact with an isocyanate includes: Products available through industrial suppliers:

- Spartan Chemical Company: 1-800-537-8990:
 - o Spartan® ShineLine Emulsifier Plus
 - o Spartan® SC-200 Heavy Duty Cleaner
- Colorimetric Laboratories, Inc. (CLI): 1-847-803-3737
 - o Isocyanate Decontamination Solution
- Mix equal amounts of the following:
 - o Mineral spirits (80%), VM&P Naphtha (15%), and household detergent (5%), and
 - o A 50-50 mixture of monoethanolamine and water

In a separate container, blend the two solutions in a 1:1 ratio by volume. Immediately prior to applying this blended neutralization solution onto the contaminated surface area, mix or agitate the container to help ensure uniform mixing of the ingredients.

If the above products are not available, the following products can be obtained through retail outlets:

- ZEP® Commercial Heavy-Duty Floor Stripper
- Greased Lightning® Super Strength Cleaner and Degreaser
- EASY OFF® Grill and Oven Cleaner or EASY OFF® Fume Free Oven Cleaner
- A mixture of 50% Simple Green® Pro HD Heavy-Duty Cleaner and 50% household ammonia
- A mixture of 90% Fantastic® Heavy Duty All Purpose Cleaner and 10% household ammonia.

Note: Always wear proper PPE when cleaning up an isocyanate spill and using a neutralization solution. It may take two or more applications of the neutralization solution to decontaminate the surface. Check for residual surface contamination using a surface wipe method such as the CLI Swype® pad.

7. Handling and storage

Storage temperature:

minimum: 10 °C (50 °F)
maximum: 38 °C (100.4 °F)

Handling/Storage Precautions

Do not breathe vapors, mists, or dusts. Use adequate ventilation to keep airborne isocyanate levels below the exposure limits. Wear respiratory protection if material is heated, sprayed, used in a confined space, or if the exposure limit is exceeded. Warning properties (irritation of the eyes, nose and throat or odor) are not adequate to prevent overexposure from inhalation. This material can produce asthmatic sensitization upon either single inhalation exposure to a relatively high concentration or upon repeated inhalation exposures to lower concentrations. Individuals with lung or breathing problems or prior allergic reactions to isocyanates must not be exposed to vapor or spray mist. Avoid contact with skin and eyes. Wear appropriate eye and skin protection. Wash thoroughly after handling. Do not breathe smoke and gases created by overheating or burning this material. Decomposition products can be highly toxic and irritating. Store in tightly closed containers to prevent moisture contamination. Do not reseal if contamination is suspected.

Further Info on Storage Conditions

Employee education and training in the safe use and handling of this product are required under the OSHA Hazard Communication Standard 29 CFR 1910.1200.

8. Exposure controls/personal protection

4,4'-Diphenylmethane Diisocyanate (MDI) (101-68-8)

US. ACGIH Threshold Limit Values

Time Weighted Average (TWA): 0.005 ppm

US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

Ceiling Limit Value: 0.02 ppm, 0.2 mg/m³

Industrial Hygiene/Ventilation Measures

Ventilation should be used to maintain levels below the TLV. To ensure that published exposure limits have not been exceeded, monitoring for airborne diisocyanate should become part of the overall employee exposure characterization program. NIOSH, OSHA, Bayer, and others have developed sampling and analytical methods. Bayer methods can be made available upon request.

Respiratory protection

Airborne MDI concentrations greater than the ACGIH TLV-TWA (TLV) or OSHA PEL-C (PEL) can

occur in inadequately ventilated environments when MDI is sprayed, aerosolized, or heated. In such cases, respiratory protection must be worn. <U>When this product is sprayed</> in combination with a polyol system ("B" side), a full-face or hood-type supplied air respirator operated in the positive pressure or continuous flow mode is required. <U>For exterior spray applications</> where the use of supplied air respiratory protection may create a safety hazard (e.g., roof applications), an air purifying respirator with combination organic vapor/particulate (P100) cartridges may be substituted for a supplied air respirator. <U>When handling heated product,</> an air purifying respirator (APR) with combination organic vapor/particulate (P100) cartridges is required. The respiratory protection selected must comply with the requirements set forth in OSHA's Respiratory Protection Standard (29 CFR 1910.134). When APRs are used, (a) the cartridges must be equipped with end-of-service life indicators (ESLI) certified by NIOSH, or (b) a change out schedule, based on objective information or data that will ensure that the cartridges are changed out before the end of their service life, must be developed and implemented. The basis for the change out schedule must be described in the written respirator program. For APR use, the airborne diisocyanate concentration must be no greater than 10 times the TLV or PEL.

Hand protection

<U>When this product is sprayed</> in combination with a polyol system ("B" side), fabric gloves coated in nitrile, neoprene, butyl or PVC are recommended. <U>When handling liquid product,</> nitrile, butyl, neoprene or PVC gloves are recommended.

Eye protection

When this product is sprayed in combination with a polyol system ("B" side), eye protection will be provided by the full-face or hood-type air supplied respirator as mentioned above in the respiratory protection section. When handling liquid product, chemical safety goggles or safety glasses with side-shields are required.

Skin and body protection

When this product is sprayed in combination with a polyol system ("B" side), a disposable full body suit (e.g., Tyvek, Kleenguard, etc.) with attached hood and disposable over-boots are required. When handling liquid product, cover as much of the exposed skin area as possible with appropriate clothing to prevent skin contact. If the potential for splash to the body exists, impermeable protective clothing (e.g., polyethylene, PVC) is recommended. Animal tests and other research indicate that skin contact with MDI can play a role in causing isocyanate sensitization and respiratory reaction. The data reinforces the need to prevent direct skin contact with isocyanates.

Medical Surveillance

All applicants who are assigned to an isocyanate work area should undergo a pre-placement medical evaluation. A history of eczema or respiratory allergies such as hay fever, are possible reasons for medical exclusion from isocyanate areas. Applicants who have a history of adult asthma should be restricted from work with isocyanates. Applicants with a history of prior isocyanate sensitization should be excluded from further work with isocyanates. A comprehensive annual medical surveillance program should be instituted for all employees who are potentially exposed to diisocyanates. Once a worker has been diagnosed as sensitized to any isocyanate, no further exposure can be permitted. Refer to the Bayer pamphlet (Medical Surveillance Program for Isocyanate Workers) for additional guidance.

Additional Protective Measures

Emergency showers and eye wash stations should be available. Educate and train employees in the safe use and handling of this product. Follow all label instructions.

9. Physical and chemical properties

Form:	liquid
Appearance	Not Available
Color:	Brown
Odor:	musty

Odor Threshold:	Not Available
pH:	not applicable
Freezing Point:	< 0 °C (32 °F) For the active ingredient.
Boiling point/boiling range:	Approximately 208 °C (406.4 °F)
Vapour pressure:	< 0.0001 mmHg @ 25 °C (77 °F)
Vapor Density:	Not Available
Specific Gravity:	1.24 @ 25 °C (77 °F)
Solubility in Water:	Insoluble - Reacts slowly with water to liberate CO ₂ gas
Bulk density:	1,234 kg/m ³

10. Stability and reactivity

Hazardous Reactions

Contact with moisture, other materials that react with isocyanates, or temperatures above 350 F (177 C), may cause polymerization. The reaction of this product with a polyol system ("B" side) will release heat (e.g., it is an exothermic reaction). Thus, spraying foam too thickly in a single lift, or not allowing sufficient time between lifts, can result in excessive heat generation to the point where the foam may char, smolder or burn. Refer to the appropriate BaySystems technical datasheet for application instructions.

Materials to avoid

Water, Amines, Strong bases, Alcohols, Copper alloys

Hazardous decomposition products

By Fire and High Heat: Carbon dioxide (CO₂), carbon monoxide (CO), oxides of nitrogen (NO_x), dense black smoke., Isocyanate, Isocyanic Acid, Other undetermined compounds

11. Toxicological information

Toxicity Data for ECOBAY OC CAN ISO

Toxicity Note

Toxicity data based on polymeric MDI.

Acute oral toxicity

LD50: > 2,000 mg/kg (rat, Male/Female)

Acute inhalation toxicity

LC50: 490 mg/m³, 4 h (rat)

Skin irritation

rabbit, Slightly irritating

Repeated dose toxicity

90 Days, inhalation: NOAEL: 1 mg/m³, (rat, Male/Female, 6 hrs/day 5 days/week)

Irritation to lungs and nasal cavity.

2 years, inhalation: NOAEL: 0.2, (rat, Male/Female, 6 hrs/day 5 days/week)

Irritation to lungs and nasal cavity.

Mutagenicity

Genetic Toxicity in Vitro:

Bacterial - gene mutation assay: negative (Salmonella typhimurium, Metabolic Activation: with/without)

Carcinogenicity

rat, Male/Female, inhalation, 2 Years, 6 hrs/day 5 days/week,

Exposure to a level of 6 mg/m³ polymeric MDI was related to the occurrence of lung tumors. This level is significantly over the TLV for MDI.

Developmental Toxicity/Teratogenicity

rat, female, inhalation, gestation days 6-15, 6 hrs/day, NOAEL (teratogenicity): 12 mg/m³, NOAEL (maternal): 4 mg/m³

No Teratogenic effects observed at doses tested., Fetotoxicity seen only with maternal toxicity.

Toxicity Data for 4,4'-Diphenylmethane Diisocyanate (MDI)**Acute inhalation toxicity**

LC50: 369 mg/m³, 4 h (rat, Male/Female)

LC50: > 2240 mg/m³, 1 h (rat) (OECD Test Guideline 403)

Acute dermal toxicity

LD50: > 10,000 mg/kg (rabbit)

Skin irritation

rabbit, Draize Test, Slightly irritating

Human, irritating

Eye irritation

rabbit, Draize, Moderately irritating

Sensitisation

dermal: sensitizer (guinea pig, Maximization Test)

inhalation: sensitizer (Guinea pig)

Repeated dose toxicity

90 Days, inhalation: NOAEL: 0.3 mg/m³, (rat, Male/Female, 18 hrs/day, 5 days/week)

Irritation to lungs and nasal cavity.

(Human)

Irritation to lungs and nasal cavity.

Mutagenicity

Genetic Toxicity in Vitro:

Ames: (Salmonella typhimurium, Metabolic Activation: with/without)

Positive and negative results were reported. The use of certain solvents which rapidly hydrolyze diisocyanates is suspected of producing the positive mutagenicity results.

Genetic Toxicity in Vivo:

Micronucleus Assay: (mouse)

negative

Micronucleus test: negative (rat, male, Inhalative (exposure period: 3x1h/day over 3 weeks))

negative

Carcinogenicity

rat, Female, inhalation, 2 Years, 17 hrs/day, 5 days/week,

negative

Other Relevant Toxicity Information

May cause irritation of respiratory tract.

12. Ecological information

Ecological Data for ECOBAY OC CAN ISO

Biodegradation

0 %, Exposure time: 28 d, i.e. not degradable

Bioaccumulation

Oncorhynchus mykiss (rainbow trout), Exposure time: 112 d, < 1 BCF
Does not bioaccumulate.

Acute and Prolonged Toxicity to Fish

LC0: > 1,000 mg/l (Danio rerio (zebra fish), 96 h)

LC0: > 3,000 mg/l (Oryzias latipes (Orange-red killifish), 96 h)

Acute Toxicity to Aquatic Invertebrates

EC50: > 1,000 mg/l (Water flea (Daphnia magna), 24 h)

Toxicity to Aquatic Plants

NOEC: 1,640 mg/l, End Point: growth (Green algae (Scenedesmus subspicatus), 72 h)

Toxicity to Microorganisms

EC50: > 100 mg/l, (activated sludge, 3 h)

Additional Ecotoxicological Remarks

Ecotoxicity data based on polymeric MDI

Ecological Data for 4,4'-Diphenylmethane Diisocyanate (MDI)

Acute and Prolonged Toxicity to Fish

LC50: > 500 mg/l (Zebra fish (Brachydanio rerio), 24 h)

Acute Toxicity to Aquatic Invertebrates

EC50: > 500 mg/l (Water flea (Daphnia magna), 24 h)

13. Disposal considerations

Waste Disposal Method

Waste disposal should be in accordance with existing federal, state and local environmental control laws.
Incineration is the preferred method.

Empty Container Precautions

Empty containers retain product residue; observe all precautions for product. Do not heat or cut empty container with electric or gas torch because highly toxic vapors and gases are formed. Do not reuse without thorough commercial cleaning and reconditioning. If container is to be disposed, ensure all product residues are removed prior to disposal.

14. Transport information

Land transport (TDG)

Non-Regulated

15. Regulatory information

DSL Status

All components of this product are on the Canadian DSL.

WHMIS Classification:

D2A, D2B Controlled

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

16. Other information

Contact person: Product Safety Department
Telephone: (412) 777-2835
MSDS Number: 112000031641
Version Date: 10/24/2014
Report version: 1.0

This information is furnished without warranty, express or implied. This information is believed to be accurate to the best knowledge of Bayer MaterialScience LLC. The information in this MSDS relates only to the specific material designated herein. Bayer MaterialScience LLC assumes no legal responsibility for use of or reliance upon the information in this MSDS.

MATERIAL SAFETY DATA SHEET



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TRANSPORTATION EMERGENCY

CALL CHEMTREC: (800) 424-9300
INTERNATIONAL: (703) 527-3887

NON-TRANSPORTATION

Emergency Phone: Call Chemtrec
Information Phone: (800) 662-2927

1. Product and Company Identification

Product Name: ECOBAY OC CAN
Material Number: 84255352
Chemical Family: Polyol System

2. Hazards Identification

Emergency Overview

Warning Color: Milky White **Form:** liquid **Odor:** slight, Ammonia.
Use cold water spray to cool fire-exposed containers to minimize the risk of rupture. Causes respiratory tract irritation. May cause allergic respiratory reaction. Causes skin irritation. May cause allergic skin reaction. May be harmful if absorbed through skin. Causes eye irritation. May cause a temporary fogging of the eyes. When this product is sprayed, a full-face or hood-type supplied air respirator is required. May be harmful if swallowed. May cause liver damage. May cause kidney damage. May cause adverse reproductive effects.

Potential Health Effects

Primary Routes of Entry: Inhalation, Eye Contact, Skin Contact

Medical Conditions Aggravated by Exposure: Respiratory disorders, Eye disorders, Skin disorders

HUMAN EFFECTS AND SYMPTOMS OF OVEREXPOSURE

Inhalation

Acute Inhalation

For Component: Tris-(2-chloroisopropyl)-phosphate

May cause respiratory tract irritation with symptoms of coughing, sore throat and runny nose.

For Component: Tertiary Amine

May cause pulmonary edema with symptoms of breathing difficulty and tightness of chest. Causes respiratory tract irritation with symptoms of coughing, sore throat and runny nose.

For Component: Tertiary Amine

Causes respiratory tract irritation with symptoms of coughing, sore throat and runny nose. May cause

allergic respiratory reaction with symptoms of coughing, wheezing, shortness of breath, bronchospasm, and reduced lung function.

Chronic Inhalation

For Component: Tertiary Amine

May cause pulmonary edema with symptoms of breathing difficulty and tightness of chest.

For Component: Tertiary Amine

May cause pulmonary edema with symptoms of breathing difficulty and tightness of chest.

Skin

Acute Skin

For Component: Tris-(2-chloroisopropyl)-phosphate

May cause slight irritation.

For Component: Tertiary Amine

If sufficient amounts are absorbed, systemic toxicity may occur with symptoms similar to those described in acute inhalation. Corrosive with symptoms of reddening, itching, swelling, burning and possible permanent damage. May be harmful if absorbed through skin.

For Component: Tertiary Amine

May cause allergic skin reaction with symptoms of reddening, itching, swelling, and rash. Corrosive with symptoms of reddening, itching, swelling, burning and possible permanent damage. Moderately toxic by skin absorption.

Eye

Acute Eye

For Component: Tris-(2-chloroisopropyl)-phosphate

Not expected to be irritating.

For Component: Tertiary Amine

Corrosive with symptoms of reddening, tearing, swelling, burning and possible permanent damage.

For Component: Tertiary Amine

Corrosive with symptoms of reddening, tearing, swelling, burning and possible permanent damage. Vapors can cause temporary corneal edema with symptoms of blurred vision or the appearance of halos around bright objects.

Chronic Eye

For Component: Tertiary Amine

Prolonged vapor contact may cause conjunctivitis.

Ingestion

Acute Ingestion

For Component: Tris-(2-chloroisopropyl)-phosphate

May be harmful if swallowed. Symptoms of ingestion may include abdominal pain, nausea, vomiting, and diarrhea. Moderately toxic by ingestion.

For Component: Tertiary Amine

Symptoms of ingestion may include abdominal pain, nausea, vomiting, and diarrhea. May be harmful if swallowed.

For Component: Tertiary Amine

May be harmful if swallowed. May cause digestive tract burns.

Chronic Ingestion

For Component: Tris-(2-chloroisopropyl)-phosphate

May cause liver damage. May cause kidney damage.

Carcinogenicity:

No carcinogenic substances as defined by IARC, NTP and/or OSHA

3. Composition/Information on Ingredients

Hazardous components

<u>Weight percent</u>	<u>Components</u>	<u>CAS-No.</u>
35 - 45%	Tris-(2-chloroisopropyl)-phosphate	13674-84-5
5 - 10%	Tertiary Amine	CAS# is a trade secret
1 - 5%	Tertiary Amine	CAS# is a trade secret
1 - 5%	Proprietary Hazardous Ingredients	CAS# is a trade secret

4. First aid measures

Eye contact

In case of contact, flush eyes with plenty of water for at least 15 minutes. Call a physician immediately.

Skin contact

In case of skin contact, wash affected areas with soap and water. Immediately remove contaminated clothing and shoes. Get medical attention.

Inhalation

If inhaled, remove to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Get medical attention.

Ingestion

If ingested, do not induce vomiting unless directed to do so by medical personnel. Get medical attention.

5. Firefighting measures

Suitable extinguishing media: Carbon dioxide (CO₂), Dry chemical, Foam, water spray for large fires.

Special Fire Fighting Procedures

Firefighters should be equipped with self-contained breathing apparatus to protect against potentially toxic and irritating fumes. Use cold water spray to cool fire-exposed containers to minimize the risk of rupture.

Unusual Fire/Explosion Hazards

The reaction of this product with polymeric MDI ("A" side) will release heat (e.g., it is an exothermic reaction). Thus, spraying foam too thickly in a single lift, or not allowing sufficient time between lifts, can result in excessive heat generation to the point where the foam may char, smolder or burn. Refer to the appropriate BaySystems technical datasheet for application instructions.

6. Accidental release measures

Spill and Leak Procedures

Evacuate and keep unnecessary people out of spill area. Remove ignition sources. Notify management. Put on protective equipment. Control source of the leak. Ventilate. Contain the spill. Cover spill with inert material (e.g., dry sand or earth) and collect for proper disposal.

7. Handling and storage

Storage temperature:

minimum: 21.11 °C (70 °F)

maximum: 26.67 °C (80 °F)

Storage period

Not Established

Handling/Storage Precautions

Handle in accordance with good industrial hygiene and safety practices. Wash thoroughly after handling. Keep container closed when not in use. Material is hygroscopic and may absorb small amounts of atmospheric moisture. If contamination with isocyanates is suspected, do not reseal containers. Do not get on skin or clothing. Do not get in eyes. Do not breathe vapours or spray mist.

Further Info on Storage Conditions

Store materials between 70°F to 80°F (21°C to 27°C) in a dry and well ventilated area for a minimum of 48 hours prior to application of material. The transit temperature range is 32°F to 100°F (0°C to 38°C).

8. Exposure controls/personal protection

When this product is heated or spray applied, amine vapors can be released.

Country specific exposure limits have not been established or are not applicable

Industrial Hygiene/Ventilation Measures

When handling this product, ventilation of the work area is recommended.

Respiratory protection

When this product is sprayed in combination with polymeric MDI ("A" side), a full-face or hood-type supplied air respirator operated in the positive pressure or continuous flow mode is required. For exterior spray applications where the use of supplied air respiratory protection may create a safety hazard (e.g., roof applications), an air purifying respirator with combination organic vapor/particulate (P100) cartridges may be substituted for a supplied air respirator. When handling the liquid product, particularly if heated or in a confined area, an air purifying respirator with combination organic vapor/particulate (P100) cartridges is recommended. The respiratory protection selected must comply with the requirements set forth in OSHA's Respiratory Protection Standard (29 CFR 1910.134). When APRs are used, (a) the cartridges must be equipped with end-of-service life indicators (ESLI) certified by NIOSH, or (b) a change out schedule, based on objective information or data that will ensure that the cartridges are changed out before the end of their service life, must be developed and implemented. The basis for the change out schedule must be described in the written respirator program.

Hand protection

When this product is sprayed in combination with polymeric MDI ("A" side), fabric gloves coated in nitrile, neoprene, butyl or PVC are recommended. When handling liquid product, nitrile, neoprene, butyl or PVC gloves are recommended.

Eye protection

When this product is sprayed in combination with polymeric MDI ("A" side), eye protection will be provided by the full-face or hood-type air supplied respirator as mentioned above in the respiratory protection section. When handling liquid product, chemical safety goggles or safety glasses with side-shields are required.

Skin and body protection

When this product is sprayed in combination with polymeric MDI ("A" side), a disposable full body suit (e.g., Tyvek, Kleenguard, etc.) with attached hood and disposable over-boots are required. When handling liquid product, wear cloth work clothing including long pants and long-sleeved shirts. If the potential for splash to the body exists, impermeable protective clothing is recommended.

Additional Protective Measures

Employees should wash their hands and face before eating, drinking, or using tobacco products. Educate and train employees in the safe use and handling of this product.

9. Physical and chemical properties

Form:	liquid
Color:	Milky White
Odor:	slight, Ammonia
pH:	Approximately 10
Freezing Point:	0 °C (32 °F)
Boiling point/boiling range:	212 °C (413.6 °F)
Flash point:	> 141 °C (285.8 °F) (Pensky-Martens closed cup)
Specific Gravity:	1.1 @ 25 °C (77 °F)
Solubility in Water:	Miscible
Viscosity, dynamic:	1,000 cps @ 20 °C (68 °F)

10. Stability and reactivity

Hazardous Reactions

Hazardous polymerisation does not occur. The reaction of this product with polymeric MDI ("A" side) will release heat (e.g., it is an exothermic reaction). Thus, spraying foam too thickly in a single lift, or not allowing sufficient time between lifts, can result in excessive heat generation to the point where the foam may char, smolder or burn. Refer to the appropriate BaySystems technical datasheet for application instructions.

Stability

Stable

Materials to avoid

Oxidizing agents, Isocyanates

Hazardous decomposition products

By Fire and Thermal Decomposition: Carbon dioxide (CO₂), carbon monoxide (CO), oxides of nitrogen (NO_x), dense black smoke., Hydrogen chloride gas, Oxides of phosphorus, Other hazardous decomposition products may be formed.

11. Toxicological information

Toxicity Data for Tris-(2-chloroisopropyl)-phosphate

Acute oral toxicity

LD50: 632 mg/kg (rat)

Acute inhalation toxicity

LC50: > 17,800 mg/l, 1 h (rat, Male/Female)
aerosol

Acute dermal toxicity

LD50: > 5,000 mg/kg (rabbit, Male/Female)

Skin irritation

human skin, Patch Test, Non-irritating
human skin, Patch Test, Non-irritating

Eye irritation

rabbit, OECD Test Guideline 405, Exposure Time: 24 h, Slightly irritating

Sensitisation

dermal: non-sensitizer (guinea pig, Maximization Test)
dermal: non-sensitizer (Human, Patch Test)

Repeated dose toxicity

90 Days, oral: NOAEL: 36 mg/kg, (Rat, male)
13 weeks, oral: NOAEL: 2500 ppm, LOAEL: 800 ppm, (Rat, male, daily)

Mutagenicity

Genetic Toxicity in Vitro:

Ames: negative (Salmonella typhimurium, Metabolic Activation: with/without)

Positive and negative results were reported.

Mammalian cell - gene mutation assay: positive (Mouse lymphoma cells (L5178Y/TK), Metabolic Activation: with)

Positive and negative results were reported.

Genetic Toxicity in Vivo:

Micronucleus test: negative (mouse, male/female, intraperitoneal)
negative

Toxicity to Reproduction/Fertility

Other method, inhalation, daily, (rat, male)

Reproductive effects have been observed in animal studies.

Two-generation study, (feeding study) oral, daily, (rat, male/female) NOAEL (parental): 85 mg/kg,

Developmental Toxicity/Teratogenicity

rat, female, oral, gestation, daily, NOAEL (teratogenicity): > 1%, NOAEL (maternal): > 1%

No Teratogenic effects observed at doses tested., No fetotoxicity observed at doses tested.

rat, female, oral, gestation, NOAEL (teratogenicity): 1,000 mg/kg, NOAEL (maternal): 1,000 mg/kg,

Toxicity Data for Tertiary Amine

Acute oral toxicity

LD50: 1,290 mg/kg (Rat)

Acute inhalation toxicity

LC50: > 2.63 mg/l, 1 h (Rat)

Acute dermal toxicity

LD50: 310 mg/kg (rabbit)

Skin irritation

rabbit, Corrosive

Eye irritation

OECD Test Guideline 405, Corrosive

Sensitisation

Skin sensitisation according to Magnusson/Kligmann (maximizing test):: negative (OECD Test Guideline 406)

Mutagenicity

Genetic Toxicity in Vitro:

Ames test: negative

Toxicity Data for Tertiary Amine

Acute oral toxicity

LD50: 2,000 mg/kg (Rat)

Acute inhalation toxicity

LC50: 6.1 mg/l, (Rat)

Acute dermal toxicity

LD50: 1,220 - 3,135 mg/kg (rabbit)

Skin irritation

rabbit, OECD Test Guideline 404, Exposure Time: 4 h, Corrosive

Eye irritation

rabbit, Draize, Corrosive

Sensitisation

dermal: sensitizer (mouse, Mouse local lymphoma assay)

Respiratory sensitization: negative (Human)

Buehler Test: non-sensitizer (guinea pig)

Repeated dose toxicity

90 Days, inhalation: NOAEL: 24 ppm, (Rat, Male/Female, 6 hrs/day 5 days/week)

Irritation to lungs and nasal cavity. Reduced body weight gain.

Mutagenicity

Genetic Toxicity in Vitro:

Ames test: negative (Salmonella typhimurium, Metabolic Activation: with/without)

Genetic Toxicity in Vivo:

In vivo micronucleus test: negative (mouse, male/female, intraperitoneal)

negative

Carcinogenicity

mouse, females, oral, 123 weeks,

negative

Toxicity to Reproduction/Fertility

inhalation, daily, (Rat, Female) NOAEL (parental): 10 ppm, NOAEL (F2): 100 ppm
No effects on Reproductive parameters observed at doses tested.
Fertility Screening, Oral, daily, (rat)

Developmental Toxicity/Teratogenicity

rat, female, inhalation, gestation, NOAEL (teratogenicity): 100 ppm, NOAEL (maternal): 10 ppm
No Teratogenic effects observed at doses tested., No fetotoxicity observed at doses tested.

Other Relevant Toxicity Information

May cause irritation of respiratory tract.

12. Ecological information

Ecological Data for Tris-(2-chloroisopropyl)-phosphate

Biodegradation

Aerobic, 0 %, Exposure time: 28 Days, Not readily biodegradable.

Bioaccumulation

Cyprinus carpio (Carp), Exposure time: 42 Days, ca. 0.8 - 2.8 BCF

Acute and Prolonged Toxicity to Fish

LC50: ca. 84 mg/l (Bluegill (*Lepomis macrochirus*), 96 h)
LC50: 51 mg/l (Fathead minnow (*Pimephales promelas*), 96 h)
LC50: 30 mg/l (Guppy (*Poecilia reticulata*), 96 h)

Acute Toxicity to Aquatic Invertebrates

EC50: ca. 131 mg/l (Water flea (*Daphnia magna*), 48 h)

Toxicity to Aquatic Plants

EC50: 45 mg/l, End Point: biomass (Green algae (*Scenedesmus subspicatus*), 72 h)
EC50: 41 - 55 mg/l, End Point: biomass (Green algae (*Selenastrum capricornutum*), 96 h)

Toxicity to Microorganisms

EC50: 295 mg/l, (*Photobacterium phosphoreum*, 30 min)
EC50: 784 mg/l, (Activated sludge microorganisms, 3 h)

Ecological Data for Tertiary Amine

Biodegradation

71.2 %, Exposure time: 28 d, i.e. readily biodegradable

Acute Toxicity to Aquatic Invertebrates

EC50: 24 mg/l (*Daphnia magna* (Water flea), 48 h)

Toxicity to Aquatic Plants

ErC50: 35 mg/l, (algae, 72 h)

Toxicity to Microorganisms

EC50: > 1,000 mg/l, (activated sludge, 72 h)

Ecological Data for Tertiary Amine

Biodegradation

aerobic, > 90 %, Exposure time: 13 Days, i.e. readily biodegradable

Biochemical Oxygen Demand (BOD)

285 O₂/g

Chemical Oxygen Demand (COD)

485 O₂/g

Acute and Prolonged Toxicity to Fish

LC50: 81 mg/l (Fathead minnow (*Pimephales promelas*), 96 h)

LC50: 100 - 220 mg/l (Golden orfe (*Leuciscus idus*), 96 h)

Acute Toxicity to Aquatic Invertebrates

EC50: 98 mg/l (Water flea (*Daphnia magna*), 48 h)

Toxicity to Aquatic Plants

EC50: 35 mg/l, (Green algae (*Scenedesmus subspicatus*), 72 h)

Toxicity to Microorganisms

EC50: > 8,000 mg/l, (*Pseudomonas putida*, 71 h)

13. Disposal considerations

Waste Disposal Method

Waste disposal should be in accordance with existing federal, state and local environmental control laws.

Empty Container Precautions

Recondition or dispose of empty container in accordance with governmental regulations.

14. Transport information

Land transport (DOT)

Non-Regulated

Sea transport (IMDG)

Non-Regulated

Air transport (ICAO/IATA)

Non-Regulated

15. Regulatory information

United States Federal Regulations

OSHA Hazcom Standard Rating: Hazardous

US. Toxic Substances Control Act: To the best of our knowledge, this material is not included in the Toxic Substances Control Act (TSCA) Inventory, and is defined as a new chemical substance which cannot be imported or manufactured for commercial purposes without complying with the Pre-manufacture Notice (PMN) requirements codified at 40CFR Part 720. Therefore, we are providing you a small quantity (as defined at 40CFR Part 720.36 (a) (1)) of this product with the understanding it is to be used solely in the course of Research and

Development (R&D), as defined in Section 5 (h) (3) of TSCA and 40 CFR Part 720.

US. EPA CERCLA Hazardous Substances (40 CFR 302):

Components

None

SARA Section 311/312 Hazard Categories:

Acute Health Hazard, Chronic Health Hazard

US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title III Section 302 Extremely Hazardous Substance (40 CFR 355, Appendix A):

Components

None

US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title III Section 313 Toxic Chemicals (40 CFR 372.65) - Supplier Notification Required:

Components

None

US. EPA Resource Conservation and Recovery Act (RCRA) Composite List of Hazardous Wastes and Appendix VIII Hazardous Constituents (40 CFR 261)

Under RCRA, it is the responsibility of the person who generates a solid waste, as defined in 40 CFR 261.2, to determine if that waste is a hazardous waste.

State Right-To-Know Information

The following chemicals are specifically listed by individual states; other product specific health and safety data in other sections of the MSDS may also be applicable for state requirements. For details on your regulatory requirements you should contact the appropriate agency in your state.

Massachusetts, New Jersey or Pennsylvania Right to Know Substance Lists:

<u>Weight percent</u>	<u>Components</u>	<u>CAS-No.</u>
35 - 45%	Tris-(2-chloroisopropyl)-phosphate	13674-84-5
>=1%	Polyether Polyol	CAS# is a trade secret
>=1%	Water	7732-18-5
5 - 10%	Tertiary Amine	CAS# is a trade secret
1 - 5%	Tertiary Amine	CAS# is a trade secret
1 - 5%	Proprietary Hazardous Ingredients	CAS# is a trade secret

New Jersey Environmental Hazardous Substances List and/or New Jersey RTK Special Hazardous Substances Lists:

<u>Weight percent</u>	<u>Components</u>	<u>CAS-No.</u>
1 - 5%	Tertiary Amine	CAS# is a trade secret

California Prop. 65:

To the best of our knowledge, this product does not contain any of the listed chemicals, which the state of California has found to cause cancer, birth defects or other reproductive harm.

16. Other information

NFPA 704M Rating

Health	2
Flammability	1
Reactivity	0
Other	

0=Insignificant 1=Slight 2=Moderate 3=High 4=Extreme

HMIS Rating

Health	2*
Flammability	1
Physical Hazard	0

0=Minimal 1=Slight 2=Moderate 3=Serious 4=Severe

* = Chronic Health Hazard

The method of hazard communication for Bayer MaterialScience LLC is comprised of Product Labels and Material Safety Data Sheets. HMIS and NFPA ratings are provided by Bayer MaterialScience LLC as a customer service.

Contact person: Product Safety Department
Telephone: (412) 777-2835
MSDS Number: 112000047717
Version Date: 07/27/2014
Report version: 1.15

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