Material Safety Data Sheet
The Dow Chemical Company

Product Name: BETAPRIME(TM) 5504G

Issue Date: 02/22/2013
Print Date: 25 Feb 2013

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. Product and Company Identification

Product Name
BETAPRIME(TM) 5504G

COMPANY IDENTIFICATION
The Dow Chemical Company
2030 Willard H. Dow Center
Midland, MI 48674
United States

Customer Information Number: 800-258-2436

EMERGENCY TELEPHONE NUMBER

24-Hour Emergency Contact: 989-636-4400
Local Emergency Contact: 989-636-4400

2. Hazards Identification

Emergency Overview
Color: Black
Physical State: Liquid.
Odor: Solvent
Hazards of product:

DANGER! Extremely flammable liquid and vapor - Vapor may cause flash fire. Causes eye irritation. May cause allergic skin reaction. May cause allergic respiratory reaction. May cause skin irritation. May be harmful if inhaled. May cause central nervous system effects; may cause respiratory tract irritation. May be harmful if swallowed. Vapor explosion hazard. Vapors may travel a long distance; ignition and/or flash back may occur. Evacuate area. Keep upwind of spill. Stay out of low areas. Warn public of downwind explosion hazard. Eliminate ignition sources.

OSHA Hazard Communication Standard
This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

Potential Health Effects

Eye Contact: May cause severe eye irritation. May cause severe corneal injury. Vapor may cause eye irritation experienced as mild discomfort and redness.
Skin Contact: Brief contact may cause slight skin irritation with local redness. Prolonged contact may cause moderate skin irritation with local redness.
Skin Absorption: Prolonged skin contact is unlikely to result in absorption of harmful amounts.
Skin Sensitization: A component in this mixture has been shown to be a skin sensitizer. Once an individual is sensitized, reexposure to very small amounts of vapor, mist or liquid isophorone diisocyanate may cause an allergic skin reaction. Animal studies have shown that skin contact with isocyanates may play a role in respiratory sensitization.
Inhalation: Vapor concentrations are attainable which could be hazardous on single exposure. May cause respiratory irritation and central nervous system depression. Symptoms may include headache, dizziness and drowsiness, progressing to incoordination and unconsciousness. May cause nausea and vomiting. For the minor component(s): Excessive exposure may cause irritation to upper respiratory tract (nose and throat) and lungs. May cause pulmonary edema (fluid in the lungs.) Effects may be delayed. Decreased lung function has been associated with overexposure to isocyanates. This material contains mineral and/or inorganic fillers. There is essentially no potential for inhalation exposure to these fillers incidental to industrial handling due to the physical state.
Respiratory Sensitization: A component in this mixture may cause an allergic respiratory response. Reexposure to extremely low isocyanate concentrations may cause allergic respiratory reactions in individuals already sensitized. Asthma-like symptoms may include coughing, difficult breathing and a feeling of tightness in the chest. Occasionally, breathing difficulties may be life threatening.
Ingestion: 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.
Aspiration hazard: Based on available information, aspiration hazard could not be determined.
Effects of Repeated Exposure: Contains component(s) which have been reported to cause effects on the following organs in animals: Liver. Respiratory tract. Tissue injury in the upper respiratory tract and lungs has been observed in laboratory animals after repeated excessive exposures to MDI/polymeric MDI aerosols. Methyl ethyl ketone has caused liver effects in laboratory animals exposed by inhalation to high concentrations. Methyl ethyl ketone is probably not neurotoxic in itself but it potentiates the neurotoxicity of methyl-n-butyl ketone and n-hexane.
Cancer Information: Lung tumors have been observed in laboratory animals exposed to respirable aerosol droplets of MDI/Polymeric MDI (6 mg/m3) for their lifetime. Tumors occurred concurrently with respiratory irritation and lung injury. Current exposure guidelines are expected to protect against these effects reported for MDI.
Birth Defects/Developmental Effects: Contains component(s) which did not cause birth defects in animals; other fetal effects occurred only at doses toxic to the mother. For the major component(s): Has caused birth defects in laboratory animals only at doses toxic to the mother.
Reproductive Effects: For the major component(s): For similar material(s): In animal studies, did not interfere with reproduction.

3. Composition Information

Component	CAS #	Amount
Methyl ethyl ketone	78-93-3	> 35.0 - < 45.0 %
ALIPHATIC BASED SILYLATED POLYMER P99-533	Not available	> 15.0 - < 25.0 %
Ethyl acetate	141-78-6	> 10.0 - < 20.0 %
3-Methoxy-1-butyl acetate	4435-53-4	< 10.0 %
Carbon black	1333-86-4	< 10.0 %
Methylenediphenyl diisocyanate , glycerol propoxylated , copolymer	68877-65-6	< 10.0 %
Phenol, 4-isocyanato-, phosphorothioate (3:1) (ester)	4151-51-3	< 10.0 %
Phenol, 4-isocyanato-,1,1',1''-phosphorothionate, react. prod. with 3-(trimethoxysilyl)-N-[3-(trimethoxysilyl)propyl]-1-propanamine	950747-06-5	< 5.0 %
4,4' -Methylenediphenyl diisocyanate	101-68-8	< 1.0 %

1-Isocyanato-3,3,5-trimethyl-5-isocyanatomethylcyclohexane	4098-71-9	< 1.0 %
Chlorobenzene	108-90-7	< 1.0 %

4. First-aid measures

Description of first aid measures

General advice: First Aid responders should pay attention to self-protection and use the recommended protective clothing (chemical resistant gloves, splash protection). If potential for exposure exists refer to Section 8 for specific personal protective equipment.
Inhalation: Move person to fresh air. If not breathing, give artificial respiration; if by mouth to mouth use rescuer protection (pocket mask, etc). If breathing is difficult, oxygen should be administered by qualified personnel. Call a physician or transport to a medical facility.
Skin Contact: 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 persists. 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: Immediately flush eyes with water; remove contact lenses, if present, after the first 5 minutes, then continue flushing eyes for at least 15 minutes. Obtain medical attention without delay, preferably from an ophthalmologist. Suitable emergency eye wash facility should be immediately available.
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), no additional symptoms and effects are anticipated.

Indication of immediate medical attention and special treatment needed

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.
Excessive exposure may aggravate preexisting asthma and other respiratory disorders (e.g. emphysema, bronchitis, reactive airways dysfunction syndrome).

5. Fire Fighting Measures

Suitable extinguishing media

Water fog or fine spray. Dry chemical fire extinguishers. Carbon dioxide fire extinguishers. Foam. Alcohol resistant foams (ATC type) are preferred. General purpose synthetic foams (including AFFF) or protein foams may function, but will be less effective.
Extinguishing Media to Avoid: Do not use direct water stream. Straight or direct water streams may not be effective to extinguish fire.

Special hazards arising from the substance or mixture

Hazardous Combustion Products: During a fire, smoke may contain the original material in addition to combustion products of varying composition which may be toxic and/or irritating. Combustion products may include and are not limited to: Nitrogen oxides. Carbon monoxide. Carbon dioxide.
Unusual Fire and Explosion Hazards: Container may vent and/or rupture due to fire. Electrically ground and bond all equipment. Flammable mixtures of this product are readily ignited even by static discharge. Vapors are heavier than air and may travel a long distance and accumulate in low lying areas. Ignition and/or flash back may occur. Flammable mixtures may exist within the vapor space of containers at room temperature. Flammable concentrations of vapor can accumulate at temperatures above flash point; see Section 9.

Advice for firefighters

Fire Fighting Procedures: Keep people away. Isolate fire and deny unnecessary entry. Stay upwind. Keep out of low areas where gases (fumes) can accumulate. Water may not be effective in extinguishing fire. Use water spray to cool fire exposed containers and fire affected zone until fire is out and danger of reignition has passed. Burning liquids may be extinguished by dilution with water. Do not use direct water stream. May spread fire. Eliminate ignition sources. Move container from fire area if this is possible without hazard. Burning liquids may be moved by flushing with water to protect personnel and minimize property damage. Avoid accumulation of water. Product may be carried across water surface spreading fire or contacting an ignition source. Contain fire water run-off if possible. Fire water run-off, if not contained, may cause environmental damage. Review the "Accidental Release Measures" and the "Ecological Information" sections of this (M)SDS.
Special Protective Equipment for Firefighters: Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots, and gloves). Avoid contact with this material during fire fighting operations. If contact is likely, change to full chemical resistant fire fighting clothing with self-contained breathing apparatus. If this is not available, wear full chemical resistant clothing with self-contained breathing apparatus and fight fire from a remote location. For protective equipment in post-fire or non-fire clean-up situations, refer to the relevant sections.

6. Accidental Release Measures

Personal precautions, protective equipment and emergency procedures: Evacuate area. Only trained and properly protected personnel must be involved in clean-up operations. Keep personnel out of low areas. Keep upwind of spill. Ventilate area of leak or spill. No smoking in area. Eliminate all sources of ignition in vicinity of spill or released vapor to avoid fire or explosion. Vapor explosion hazard. Keep out of sewers. For large spills, warn public of downwind explosion hazard. Check area with combustible gas detector before reentering area. Ground and bond all containers and handling equipment. Refer to Section 7, Handling, for additional precautionary measures. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.

Environmental precautions: Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information.

Methods and materials for containment and cleaning up: Contain spilled material if possible. Absorb with materials such as: Cat litter. Sand. Sawdust. Ground and bond all containers and handling equipment. Pump with explosion-proof equipment. If available, use foam to smother or suppress. Collect in suitable and properly labeled containers. See Section 13, Disposal Considerations, for additional information.

7. Handling and Storage

Handling

General Handling: Keep away from heat, sparks and flame. Avoid contact with eyes, skin, and clothing. Avoid prolonged or repeated contact with skin. Avoid breathing vapor or mist. Do not

swallow. Wash thoroughly after handling. Keep container closed. Use only with adequate ventilation. No smoking, open flames or sources of ignition in handling and storage area. Ignition sources can include and are not limited to pilot lights, flames, smoking, sparks, heaters, electrical equipment, and static discharges. Electrically bond and ground all containers, personnel and equipment before transfer or use of material. Use of non-sparking or explosion-proof equipment may be necessary, depending upon the type of operation. Containers, even those that have been emptied, can contain vapors. Do not cut, drill, grind, weld, or perform similar operations on or near empty containers. Vapors are heavier than air and may travel a long distance and accumulate in low lying areas. Ignition and/or flash back may occur. Never use air pressure for transferring product unless a risk assesment has been conducted that includes consideration of the flammability of the product. See Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION.

Storage

Minimize sources of ignition, such as static build-up, heat, spark or flame. Keep container closed. Flammable mixtures may exist within the vapor space of containers at room temperature.

Shelf life: Use within	**Storage temperature:**
9 Months	> 5 - < 25 °C

8. Exposure Controls / Personal Protection

Exposure Limits

Component	List	Type	Value
Methyl ethyl ketone	ACGIH	TWA	200 ppm BEI
	ACGIH	STEL	300 ppm BEI
	OSHA Table Z-1	PEL	590 mg/m3 200 ppm
Ethyl acetate	ACGIH	TWA	400 ppm
	OSHA Table Z-1	PEL	1,400 mg/m3 400 ppm
4,4' -Methylenediphenyl diisocyanate	ACGIH	TWA	0.005 ppm
	OSHA Table Z-1	Ceiling	0.2 mg/m3 0.02 ppm
1-Isocyanato-3,3,5-trimethyl-5-isocyanatomethylcyclohexane	ACGIH	TWA	0.005 ppm
Chlorobenzene	ACGIH	TWA	10 ppm BEI
	OSHA Table Z-1	PEL	350 mg/m3 75 ppm

Although some of the components of this product may have exposure guidelines, no exposure would be expected under normal handling conditions due to the physical state of the material.
A BEI notation following the exposure guideline refers to a guidance value for assessing biological monitoring results as an indicator of the uptake of a substance from all routes of exposures.

Personal Protection

Eye/Face Protection: Use chemical goggles. If exposure causes eye discomfort, use a full-face respirator.
Skin 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.

Hand protection: Use gloves chemically resistant to this material. Butyl rubber. Polyethylene. Ethyl vinyl alcohol laminate ("EVAL"). Examples of acceptable glove barrier materials include: Chlorinated polyethylene. Neoprene. Nitrile/butadiene rubber ("nitrile" or "NBR"). Viton. 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.

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.

Ingestion: Use good personal hygiene. Do not consume or store food in the work area. Wash hands before smoking or eating.

Engineering Controls

Ventilation: 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.

9. Physical and Chemical Properties

Appearance	
Physical State	Liquid.
Color	Black
Odor	Solvent
Odor Threshold	No test data available
pH	No test data available
Melting Point	No test data available
Freezing Point	No test data available
Boiling Point (760 mmHg)	80 °C (176 °F) *Literature* .
Flash Point - Closed Cup	-10.00 °C (14.00 °F) *Estimated.*
Evaporation Rate (Butyl Acetate = 1)	No test data available
Flammability (solid, gas)	Flammable liquid
Flammable Limits In Air	**Lower**: No test data available **Upper**: No test data available
Vapor Pressure	No test data available
Vapor Density (air = 1)	No test data available
Specific Gravity (H2O = 1)	1.000 *Estimated.*
Solubility in water (by weight)	No test data available
Partition coefficient, n-octanol/water (log Pow)	No data available for this product. See Section 12 for individual component data.
Autoignition Temperature	No test data available
Decomposition Temperature	No test data available
Dynamic Viscosity	No test data available
Kinematic Viscosity	No test data available
Explosive properties	No test data available
Oxidizing properties	No test data available
Volatile Organic Compounds	No test data available

10. Stability and Reactivity

Reactivity
No dangerous reaction known under conditions of normal use.

Chemical stability
Stable under recommended storage conditions. See Storage, Section 7.

Possibility of hazardous reactions
Polymerization will not occur.

Conditions to Avoid: Exposure to elevated temperatures can cause product to decompose. Avoid static discharge.

Incompatible Materials: Avoid contact with: Acids. Bases. Oxidizers.

Hazardous decomposition products
Decomposition products depend upon temperature, air supply and the presence of other materials.

11. Toxicological Information

Acute Toxicity
Ingestion
Single dose oral LD50 has not been determined.
Dermal
The dermal LD50 has not been determined.
Inhalation
The LC50 has not been determined.
Eye damage/eye irritation
May cause severe eye irritation. May cause severe corneal injury. Vapor may cause eye irritation experienced as mild discomfort and redness.
Skin corrosion/irritation
Brief contact may cause slight skin irritation with local redness. Prolonged contact may cause moderate skin irritation with local redness.
Sensitization
Skin
A component in this mixture has been shown to be a skin sensitizer. Once an individual is sensitized, reexposure to very small amounts of vapor, mist or liquid isophorone diisocyanate may cause an allergic skin reaction. Animal studies have shown that skin contact with isocyanates may play a role in respiratory sensitization.
Respiratory
A component in this mixture may cause an allergic respiratory response. Reexposure to extremely low isocyanate concentrations may cause allergic respiratory reactions in individuals already sensitized. Asthma-like symptoms may include coughing, difficult breathing and a feeling of tightness in the chest. Occasionally, breathing difficulties may be life threatening.
Repeated Dose Toxicity
Contains component(s) which have been reported to cause effects on the following organs in animals: Liver. Respiratory tract. Tissue injury in the upper respiratory tract and lungs has been observed in laboratory animals after repeated excessive exposures to MDI/polymeric MDI aerosols. Methyl ethyl ketone has caused liver effects in laboratory animals exposed by inhalation to high concentrations. Methyl ethyl ketone is probably not neurotoxic in itself but it potentiates the neurotoxicity of methyl-n-butyl ketone and n-hexane.
Chronic Toxicity and Carcinogenicity
Lung tumors have been observed in laboratory animals exposed to respirable aerosol droplets of MDI/Polymeric MDI (6 mg/m3) for their lifetime. Tumors occurred concurrently with respiratory

irritation and lung injury. Current exposure guidelines are expected to protect against these effects reported for MDI.

Carcinogenicity Classifications:

Component	List	Classification
Chlorobenzene	ACGIH	Confirmed animal carcinogen with unknown relevance to humans.; Group A3

Developmental Toxicity

Contains component(s) which did not cause birth defects in animals; other fetal effects occurred only at doses toxic to the mother. For the major component(s): Has caused birth defects in laboratory animals only at doses toxic to the mother.

Reproductive Toxicity

For the major component(s): For similar material(s): In animal studies, did not interfere with reproduction.

Genetic Toxicology

Contains component(s) which were negative in some in vitro genetic toxicity studies and positive in others. Contains component(s) which were negative in animal genetic toxicity studies.

12. Ecological Information

Toxicity

Data for Component: **Methyl ethyl ketone**

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).

Fish Acute & Prolonged Toxicity

LC50, Pimephales promelas (fathead minnow), static test, 96 h: 2,993 mg/l
LC50, Lepomis macrochirus (Bluegill sunfish), static test, 96 h: 1,690 mg/l

Aquatic Invertebrate Acute Toxicity

EC50, Daphnia magna (Water flea), static test, 48 h, immobilization: 308 mg/l

Aquatic Plant Toxicity

ErC50, Pseudokirchneriella subcapitata, static test, Growth rate inhibition, 96 h: 2,029 mg/l

Toxicity to Micro-organisms

EC50, hUCC; Bacteria, 96 h: > 1,000 mg/l

Data for Component: **ALIPHATIC BASED SILYLATED POLYMER P99-533**

No relevant information found.

Data for Component: **Ethyl acetate**

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).

Fish Acute & Prolonged Toxicity

LC50, Oncorhynchus mykiss (rainbow trout), 96 h: 320 mg/l

Aquatic Invertebrate Acute Toxicity

EC50, Daphnia magna (Water flea), static test, 48 h, immobilization: 717 mg/l

Aquatic Plant Toxicity

NOEC, Pseudokirchneriella subcapitata (green algae), static test, biomass growth inhibition, 96 h: 2,000 mg/l
EbC50, alga Scenedesmus sp., static test, biomass growth inhibition, 48 h: 3,300 mg/l

Fish Chronic Toxicity Value (ChV)

Pimephales promelas (fathead minnow), 32 d, NOEC:< 9.65 mg/l

Aquatic Invertebrates Chronic Toxicity Value

Daphnia magna (Water flea), 21 d, number of offspring, NOEC: 12 mg/l, LOEC: 23 mg/l

Data for Component: **3-Methoxy-1-butyl acetate**

Material is moderately toxic to aquatic organisms on an acute basis (LC50/EC50 between 1 and 10 mg/L in the most sensitive species tested).

Fish Acute & Prolonged Toxicity

LC50, Danio rerio (zebra fish), semi-static test, 96 h: 7.1 mg/l

Aquatic Invertebrate Acute Toxicity
EC50, Daphnia magna (Water flea), 24 h, immobilization: 360 mg/l
LC50, crustacean Chaetogammarus marinus, 96 h: 128 mg/l
Toxicity to Micro-organisms
EC50; Bacteria, 16 h: > 1,000 mg/l

Data for Component: **Carbon black**
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).

Fish Acute & Prolonged Toxicity
LC50, Leuciscus idus (Golden orfe), static test, 96 h: > 1,000 mg/l
Aquatic Invertebrate Acute Toxicity
EC50, Daphnia magna (Water flea), 24 h, immobilization: > 5,600 mg/l

Data for Component: **Methylenediphenyl diisocyanate , glycerol propoxylated , copolymer**
No relevant information found.

Data for Component: **Phenol, 4-isocyanato-, phosphorothioate (3:1) (ester)**
No relevant data found.

Data for Component: **Phenol, 4-isocyanato-,1,1',1''-phosphorothionate, react. prod. with 3-(trimethoxysilyl)-N-[3-(trimethoxysilyl)propyl]-1-propanamine**
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).

Aquatic Invertebrate Acute Toxicity
EC50, Daphnia magna (Water flea), 48 h, immobilization: > 100 mg/l
Aquatic Plant Toxicity
EL50, Desmodesmus subspicatus (green algae), Growth inhibition, Growth rate inhibition, 72 h: > 160 mg/l

Data for Component: **4,4' -Methylenediphenyl diisocyanate**
The measured ecotoxicity is that of the hydrolyzed product, generally under conditions maximizing production of soluble species. 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).

Fish Acute & Prolonged Toxicity
Based on information for a similar material: LC50, Danio rerio (zebra fish), static test, 96 h: > 1,000 mg/l
Aquatic Invertebrate Acute Toxicity
Based on information for a similar material: EC50, Daphnia magna (Water flea), static test, 24 h: > 1,000 mg/l
Aquatic Plant Toxicity
Based on information for a similar material: NOEC, Desmodesmus subspicatus (green algae), static test, Growth rate inhibition, 72 h: 1,640 mg/l
Toxicity to Micro-organisms
Based on information for a similar material: EC50, activated sludge test (OECD 209), Respiration inhibition, 3 h: > 100 mg/l
Toxicity to Soil Dwelling Organisms
EC50, Eisenia fetida (earthworms), 14 d: > 1,000 mg/kg

Data for Component: **1-Isocyanato-3,3,5-trimethyl-5-isocyanatomethylcyclohexane**
Material is moderately toxic to aquatic organisms on an acute basis (LC50/EC50 between 1 and 10 mg/L in the most sensitive species tested). For this family of materials: The measured ecotoxicity is that of the hydrolyzed product, generally under conditions maximizing production of soluble species.

Fish Acute & Prolonged Toxicity
LC50, Leuciscus idus (Golden orfe), static test, 48 h: 1.8 mg/l
Aquatic Invertebrate Acute Toxicity
LC50, Daphnia magna (Water flea), 24 h, immobilization: 84 mg/l
Aquatic Plant Toxicity
EbC50, alga Scenedesmus sp., biomass growth inhibition, 72 h: 119 mg/l

Toxicity to Micro-organisms
EC10; Bacteria, 6 h: 554 mg/l

Data for Component: **Chlorobenzene**

Material is moderately toxic to aquatic organisms on an acute basis (LC50/EC50 between 1 and 10 mg/L in the most sensitive species tested).

Fish Acute & Prolonged Toxicity
LC50, Lepomis macrochirus (Bluegill sunfish), 96 h: 7.4 mg/l
LC50, Oncorhynchus mykiss (rainbow trout), flow-through test, 96 h: 7.5 mg/l
Aquatic Invertebrate Acute Toxicity
EC50, Daphnia magna (Water flea), 48 h, immobilization: 19.9 mg/l
Aquatic Plant Toxicity
ErC50, Pseudokirchneriella subcapitata (green algae), Growth rate inhibition, 48 h: 220 mg/l
Toxicity to Soil Dwelling Organisms
LC50, Eisenia fetida (earthworms), 2 d: 29 mg/cm2

Persistence and Degradability

Data for Component: **Methyl ethyl ketone**

Material is readily biodegradable. Passes OECD test(s) for ready biodegradability.

OECD Biodegradation Tests:

Biodegradation	Exposure Time	Method	10 Day Window
98 %	28 d	OECD 301D Test	Not applicable

Indirect Photodegradation with OH Radicals

Rate Constant	Atmospheric Half-life	Method
1.33E-12 cm3/s	8 d	Estimated.

Biological oxygen demand (BOD):

BOD 5	BOD 10	BOD 20	BOD 28
71 - 76 %	71 - 82 %	71 - 89 %	

Theoretical Oxygen Demand: 2.44 mg/mg

Data for Component: **ALIPHATIC BASED SILYLATED POLYMER P99-533**

No relevant data found.

Data for Component: **Ethyl acetate**

Material is readily biodegradable. Passes OECD test(s) for ready biodegradability.

OECD Biodegradation Tests:

Biodegradation	Exposure Time	Method	10 Day Window
100 %	28 d	OECD 301D Test	pass

Biological oxygen demand (BOD):

BOD 5	BOD 10	BOD 20	BOD 28
65 - 71 %	67 - 77 %	77 - 90 %	

Theoretical Oxygen Demand: 1.82 mg/mg

Data for Component: **3-Methoxy-1-butyl acetate**

Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Material is ultimately biodegradable (reaches > 70% biodegradation in OECD test(s) for inherent biodegradability).

OECD Biodegradation Tests:

Biodegradation	Exposure Time	Method	10 Day Window
63.5 %	14 d	OECD 301C Test	Not applicable
> 90 %	12 d	OECD 301E Test	pass
> 95 %	20 d	OECD 302B Test	Not applicable

Indirect Photodegradation with OH Radicals

Rate Constant	Atmospheric Half-life	Method
1.88E-11 cm3/s	0.57 d	Estimated.

Theoretical Oxygen Demand: 1.97 mg/mg

Data for Component: **Carbon black**

Biodegradation is not applicable.

Data for Component: **Methylenediphenyl diisocyanate , glycerol propoxylated , copolymer**

No relevant data found.

Data for Component: **Phenol, 4-isocyanato-, phosphorothioate (3:1) (ester)**

Indirect Photodegradation with OH Radicals

Rate Constant	Atmospheric Half-life	Method
6.49E-11 cm3/s	0.165 d	Estimated.

Data for Component: **Phenol, 4-isocyanato-,1,1',1''-phosphorothionate, react. prod. with 3-(trimethoxysilyl)-N-[3-(trimethoxysilyl)propyl]-1-propanamine**

Based on stringent OECD test guidelines, this material cannot be considered as readily biodegradable; however, these results do not necessarily mean that the material is not biodegradable under environmental conditions.

OECD Biodegradation Tests:

Biodegradation	Exposure Time	Method	10 Day Window
23 %	28 d	OECD 301B Test	fail

Data for Component: **4,4' -Methylenediphenyl diisocyanate**

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.

OECD Biodegradation Tests: Based on information for a similar material:

Biodegradation	Exposure Time	Method	10 Day Window
0 %	28 d	OECD 302C Test	Not applicable

Data for Component: **1-Isocyanato-3,3,5-trimethyl-5-isocyanatomethylcyclohexane**

Based on stringent OECD test guidelines, this material cannot be considered as readily biodegradable; however, these results do not necessarily mean that the material is not biodegradable under environmental conditions. 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.

OECD Biodegradation Tests:

Biodegradation	Exposure Time	Method	10 Day Window
62 %	28 d	OECD 301E Test	fail

Indirect Photodegradation with OH Radicals

Rate Constant	Atmospheric Half-life	Method
8.82E-12 cm3/s	1.212 d	Estimated.

Theoretical Oxygen Demand: 2.59 mg/mg

Data for Component: **Chlorobenzene**

Biodegradation under aerobic static laboratory conditions is high (BOD20 or BOD28/ThOD > 40%).

OECD Biodegradation Tests:

Biodegradation	Exposure Time	Method	10 Day Window
15 %	28 d	OECD 301C Test	Not applicable

Theoretical Oxygen Demand: 1.99 mg/mg

Bioaccumulative potential

Data for Component: **Methyl ethyl ketone**

Bioaccumulation: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).

Partition coefficient, n-octanol/water (log Pow): 0.29 Measured

Data for Component: **ALIPHATIC BASED SILYLATED POLYMER P99-533**

Bioaccumulation: No relevant data found.

Data for Component: **Ethyl acetate**

Bioaccumulation: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).

Partition coefficient, n-octanol/water (log Pow): 0.73 Measured
Bioconcentration Factor (BCF): 30; Fish; Measured

Data for Component: **3-Methoxy-1-butyl acetate**
Bioaccumulation: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).
Partition coefficient, n-octanol/water (log Pow): 1.01 Estimated.

Data for Component: **Carbon black**
Bioaccumulation: No relevant data found.

Data for Component: **Methylenediphenyl diisocyanate , glycerol propoxylated , copolymer**
Bioaccumulation: No relevant data found.

Data for Component: **Phenol, 4-isocyanato-, phosphorothioate (3:1) (ester)**
Bioaccumulation: Bioconcentration potential is low (BCF less than 100 or log Pow greater than 7).
Partition coefficient, n-octanol/water (log Pow): 8.27 Estimated.

Data for Component: **Phenol, 4-isocyanato-,1,1',1''-phosphorothionate, react. prod. with 3-(trimethoxysilyl)-N-[3-(trimethoxysilyl)propyl]-1-propanamine**
Bioaccumulation: No bioconcentration is expected because of the relatively high molecular weight (MW greater than 1000).

Data for Component: **4,4' -Methylenediphenyl diisocyanate**
Bioaccumulation: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).
In the aquatic and terrestrial environment, movement is expected to be limited by its reaction with water forming predominantly insoluble polyureas.
Bioconcentration Factor (BCF): Bioconcentration potential is low (BCF < 100 or Log Pow < 3). 92; Cyprinus carpio (Carp)

Data for Component: **1-Isocyanato-3,3,5-trimethyl-5-isocyanatomethylcyclohexane**
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.
Partition coefficient, n-octanol/water (log Pow): 4.75 Estimated.

Data for Component: **Chlorobenzene**
Bioaccumulation: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).
Partition coefficient, n-octanol/water (log Pow): 2.89 Measured
Bioconcentration Factor (BCF): 10 - 100; Fish; Measured

Mobility in soil

Data for Component: **Methyl ethyl ketone**
Mobility in soil: Potential for mobility in soil is very high (Koc between 0 and 50).
Partition coefficient, soil organic carbon/water (Koc): 3.8 Estimated.
Henry's Law Constant (H): 2.44E-05 atm*m3/mole; 25 °C Measured

Data for Component: **ALIPHATIC BASED SILYLATED POLYMER P99-533**
Mobility in soil: No relevant data found.

Data for Component: **Ethyl acetate**
Mobility in soil: Potential for mobility in soil is very high (Koc between 0 and 50).
Partition coefficient, soil organic carbon/water (Koc): 3 Estimated.
Henry's Law Constant (H): 1.2E-04 atm*m3/mole; 25 °C Measured

Data for Component: **3-Methoxy-1-butyl acetate**
Mobility in soil: Potential for mobility in soil is very high (Koc between 0 and 50).
Partition coefficient, soil organic carbon/water (Koc): 10 Estimated.
Henry's Law Constant (H): 7.24E-06 atm*m3/mole; 25 °C Estimated.

Data for Component: **Carbon black**
Mobility in soil: No relevant data found.

Data for Component: **Methylenediphenyl diisocyanate , glycerol propoxylated , copolymer**
Mobility in soil: No relevant data found.

Data for Component: **Phenol, 4-isocyanato-, phosphorothioate (3:1) (ester)**
Mobility in soil: Expected to be relatively immobile in soil (Koc > 5000).
Partition coefficient, soil organic carbon/water (Koc): > 5,000 Estimated.
Henry's Law Constant (H): 4.64E-10 atm*m3/mole Estimated.

Data for Component: **Phenol, 4-isocyanato-,1,1',1''-phosphorothionate, react. prod. with 3-(trimethoxysilyl)-N-[3-(trimethoxysilyl)propyl]-1-propanamine**
Mobility in soil: No data available.

Data for Component: **4,4' -Methylenediphenyl diisocyanate**

Mobility in soil: In the aquatic and terrestrial environment, movement is expected to be limited by its reaction with water forming predominantly insoluble polyureas.

Data for Component: **1-Isocyanato-3,3,5-trimethyl-5-isocyanatomethylcyclohexane**

Mobility in soil: 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.
Partition coefficient, soil organic carbon/water (Koc): 36,000 Estimated.
Henry's Law Constant (H): 6.57E-05 atm*m3/mole; 25 °C Estimated.

Data for Component: **Chlorobenzene**

Mobility in soil: Potential for mobility in soil is high (Koc between 50 and 150).
Partition coefficient, soil organic carbon/water (Koc): 79 Measured
Henry's Law Constant (H): 3.45E-03 atm*m3/mole; 25 °C Measured

13. Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER. All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator. AS YOUR SUPPLIER, WE HAVE NO CONTROL OVER THE MANAGEMENT PRACTICES OR MANUFACTURING PROCESSES OF PARTIES HANDLING OR USING THIS MATERIAL. THE INFORMATION PRESENTED HERE PERTAINS ONLY TO THE PRODUCT AS SHIPPED IN ITS INTENDED CONDITION AS DESCRIBED IN MSDS SECTION: Composition Information. FOR UNUSED & UNCONTAMINATED PRODUCT, the preferred options include sending to a licensed, permitted: Incinerator or other thermal destruction device.

Treatment and disposal methods of used packaging: Empty containers should be recycled or otherwise disposed of by an approved waste management facility. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator. Do not re-use containers for any purpose.

14. Transport Information

DOT Non-Bulk
Proper Shipping Name: COATING SOLUTION
Hazard Class: 3 **ID Number:** UN1139 **Packing Group:** PG II

DOT Bulk
Proper Shipping Name: COATING SOLUTION
Hazard Class: 3 **ID Number:** UN1139 **Packing Group:** PG II

IMDG
Proper Shipping Name: COATING SOLUTION
Hazard Class: 3 **ID Number:** UN1139 **Packing Group:** PG II
EMS Number: F-E,S-E
Marine pollutant.: No

ICAO/IATA
Proper Shipping Name: COATING SOLUTION
Hazard Class: 3 **ID Number:** UN1139 **Packing Group:** PG II
Cargo Packing Instruction: 364
Passenger Packing Instruction: 353
Additional Information

Reportable quantity: 10,000 lb – CHLOROBENZENE, 11,111 lb – METHYL ETHYL KETONE

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. 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

OSHA Hazard Communication Standard
This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Sections 311 and 312

Immediate (Acute) Health Hazard	Yes
Delayed (Chronic) Health Hazard	No
Fire Hazard	Yes
Reactive Hazard	No
Sudden Release of Pressure Hazard	No

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Section 313
To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

Pennsylvania (Worker and Community Right-To-Know Act): Pennsylvania Hazardous Substances List and/or Pennsylvania Environmental Hazardous Substance List:
The following product components are cited in the Pennsylvania Hazardous Substance List and/or the Pennsylvania Environmental Substance List, and are present at levels which require reporting.

Component	CAS #	Amount
Methyl ethyl ketone	78-93-3	> 35.0 - < 45.0 %
Ethyl acetate	141-78-6	> 10.0 - < 20.0 %
Carbon black	1333-86-4	< 10.0 %

Pennsylvania (Worker and Community Right-To-Know Act): Pennsylvania Special Hazardous Substances List:
To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

California Proposition 65 (Safe Drinking Water and Toxic Enforcement Act of 1986)
This product contains no listed substances known to the State of California to cause cancer, birth defects or other reproductive harm, at levels which would require a warning under the statute.

US. Toxic Substances Control Act
All components of this product are either on the TSCA Inventory, are exempt from TSCA Inventory Requirements under 40 CFR 720.30, or comply with the PMN Polymer Exemption 40 CFR 723.250.

US. New Jersey Worker and Community Right-to-Know Act (New Jersey Statute Annotated Section 34:5A-5)
The following product components are cited in the New Jersey Environmental Hazardous and Workplace Hazardous Substance Lists:

Component	CAS #	Amount
Methyl ethyl ketone	78-93-3	> 35.0 - < 45.0 %
Ethyl acetate	141-78-6	> 10.0 - < 20.0 %
3-Methoxy-1-butyl acetate	4435-53-4	< 10.0 %

Carbon black	1333-86-4	< 10.0 %

US. New Jersey Worker and Community Right-to-Know Act (New Jersey Statute Annotated Section 34:5A-5)

The following product components are cited in the New Jersey Special Hazardous Substance List:

Component	CAS #	Amount
Methyl ethyl ketone	78-93-3	> 35.0 - < 45.0 %
Ethyl acetate	141-78-6	> 10.0 - < 20.0 %
Carbon black	1333-86-4	< 10.0 %

16. Other Information

Hazard Rating System

NFPA	Health	Fire	Reactivity
	2	3	0

Recommended Uses and Restrictions

Identified uses

A primer -- For use in automotive applications.

Revision

Identification Number: 1048641 / 0000 / Issue Date 02/22/2013 / Version: 7.0

Most recent revision(s) are noted by the bold, double bars in left-hand margin throughout this document.

Legend

N/A	Not available
W/W	Weight/Weight
OEL	Occupational Exposure Limit
STEL	Short Term Exposure Limit
TWA	Time Weighted Average
ACGIH	American Conference of Governmental Industrial Hygienists, Inc.
DOW IHG	Dow Industrial Hygiene Guideline
WEEL	Workplace Environmental Exposure Level
HAZ_DES	Hazard Designation
Action Level	A value set by OSHA that is lower than the PEL which will trigger the need for activities such as exposure monitoring and medical surveillance if exceeded.

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