MATERIAL SAFETY DATA SHEET

Color-Crown Cororation
928 Sligh Avenue
Seffner, FL 33584

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Durothane B

PRODUCT IDENTIFICATION

TRADE NAME – Durothane B **CAS# -** Mixture

CHEMICAL NAME – Biuret of Hexamethylene Dilosyanate; HDB; HDI Biuret

FORMULA – $C_{23}H_{36}N_6O_0$ **DOT CLASS –** 9

EMERGENCY CONTACT – Chemtrec (800) 424-9300

TELEPHONE NUMBER FOR INFORMATION – (813) 655-4880

OSHA Hazard Communication
Status…..This product is hazardous under criteria of the federal OSHA hazard communication standard 29 CFR 1910.1200.

SECTION 1-HAZARDOUS INGREDIENTS

Components:	%:	OSHA-PEL:	ACGIH-TLV:
Homopolymer of HDI (CAS# 28182-81-2)	99.3		
Hexamethylene Dilsocyanate HDI (CAS# 822-06-0)	*%	ME	.005ppm TWA

The recommended Manufacturer guideline level for HDI based Polylsocyanates is: 0.5 mg/m3 and 1.0 mg/m3. Short term exposure (STEL – averaged over 15 minutes)

* Monomer content is less than 0.7% based on resin solid at the time of manufacturer. However, after 3-6 months storage, the free monomer content may rise to a maximum of 1.6%.

SECTION 2-PHYSICAL DATA

Appearance ..... Liquid
Color..... Clear/Pale Yellow
Odor ..... Negligible
Molecular Weight..... Approx. 500 (Polyisocyanate)
Melt Point/Freeze Point ..... NE
Boiling Point..... Approx. 428°F (220C)
Vapor Pressure..... 12 mmHg @ 50C (122F)
Specific Gravity..... 1.1 @ 77°F
Solubility In Water ..... Insoluble – Reacts slowly with water to liberate CO_2 Gas
% Volatile By Weight..... Negligible

SECTION 3-FIRE & EXPLOSION DATA

Flash Point °F ..... 375°F Setaflash

Extinguishing Media: Dry chemical (EG. Monoammonium Phosphate, Potassium Sulfate, and Potassium Chloride), Carbon Dioxide, High Expansion (Proteinic) Chemical Foam, water spray for large fires.

Special Fire Fighting Procedures/Unusual Fire And Explosion Hazards: Full emergency equipment with self-contained breathing apparatus and full protective clothing should be worn by fire fighters. During a fire, IPDI vapors and other irritating, highly toxic gases may be generated by thermal decomposition or combustion. Isolate from heat, electrical equipment, sparks and open flame. Closed container may explode when exposed to extreme heat or burst when contaminated with water (CO2 evolved). Solvent vapors may be heavier than air. Stagnant air may cause vapors to accumulate and travel along the ground to an ignition source which may result in a flash back to the source of the vapors.

SECTION 4-HUMAN HEALTH DATA

Primary Routes Of Exposure: Inhalation, skin contact, eye contact.
Human Effects: Signs and symptoms of overexposure

Inhalation:

Acute Exposure IPDI and HDI vapors or mist at concentrations above the intended TLV 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 preexisting, nonspecific bronchial hyperactivity can respond to concentrations below the intended TLV with similar symptoms as well as an asthma attack. Exposure well above the TLV may lead to bronchitis, bronchial spasm and pulmonary edema (fluid in lungs). These effects are usually reversible. Chemical or hypersensitive pneumonitis, with flu-like symptoms (EG. fever, chills) has also been reported. Solvent vapors may be irritating to the eyes, nose and throat. Symptoms of irritation may include: redness, burning and itching of the eyes, dryness of the throat and tightness in the chest. Other possible symptoms of overexposure include: headache, nausea, narcosis, fatigue and loss of appetite. Persons exposed to 200 PPM of xylene experienced eye, nose and throat irritation. Concentrations of 10,000 PPM of xylene can be immediately dangerous to life and health. Deliberately breathing concentrated vapors (glue sniffing) can result in permanent brain and nervous system damage or death.
Chronic Exposure As a result of previous repeated overexposures or a single large dose, certain individuals will develop isocyanate sensitization (chemical asthma) which will cause them to react to a later exposure to isocyanate at levels well below the intended TLV. These symptoms, which include: chest tightness, wheezing, cough, shortness of breath or asthmatic attack, could be immediate or delayed up to several hours after exposure. 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 increase in severe cases for several years. Chronic overexposure to isocyanates has also been reported to cause lung damage, including decrease in lung function, which may be permanent. Sensitization may be either temporary or permanent. Chronic exposure to organic solvents has been associated with various neurotoxic effects including permanent brain and nervous system damage. Symptoms include: loss of memory, loss of intellectual ability and loss of coordination.

Skin Contact:
Acute Exposure Isocyanates react with skin protein and moisture and can cause irritation. Symptoms of skin irritation may be reddening, swelling, rash, scaling or blistering. Some persons may develop skin sensitization from skin contact. Cured material is difficult to remove. Repeated or prolonged skin contact with Xylene and PMA can result in dry, defaced and cracked skin causing increased susceptibility to infection. In addition, skin irritation (IE. Redness, swelling) which may develop into dermatitis may occur from skin contact. These solvents can penetrate the skin and may cause systemic effects similar to those identified under acute inhalations symptoms.
Chronic Exposure Prolonged contact with the isocyanate can cause reddening, swelling, rash, scaling or blistering. In those who have developed a skin sensitization, these symptoms can develop as a result of contact with very small amounts of liquid material or even as a result of vapor-only exposure. Chronic skin exposure to solvents may cause effects similar to those identified under chronic inhalation effects.

Eye Contact:
Acute Exposure Liquid Aerosols or vapors of this product (isocyanate and solvents) are irritating and can cause tearing, reddening and swelling accompanied by stinging sensation and maybe a feeling like that of fine dust in the eyes.
Chronic Exposure Prolonged vapor contact may cause conjunctivitis.

Ingestion:
Acute Exposure Can result in irritation and possible corrosive action in the mouth, stomach tissue and digestive tract. Vomiting may cause aspiration of the solvent resulting in chemical pneumonitis.
Chronic Exposure None found.
Medical Conditions Aggravated By Exposure Asthma and any other respiratory disorders. (Bronchitis, emphysema, hyperactivity), skin allergies, eczema.
Carcinogenicity NTP.....Not Listed
IARC.....Not Listed
OSHA .....Not Regulated
Exposure limits: Not established for product as whole. Refer to section 11 for exposure limits of hazardous constituents.

SECTION 5-EMERGENCY & FIRST AID PROCEDURES

Eye Contact: Flush with clean, lukewarm water (low pressure) for at least 15 minutes while lifting eyelids. Refer individual to physician or ophthalmologist for immediate follow-up.
Skin Contact: Remove contaminated clothing immediately. Wash affected areas thoroughly with soap (green tincture soap is recommended) and water. Wash contaminated clothing thoroughly before reuse. For severe exposures, get under safety shower after removing clothing, then get medical attention. For lesser exposures, seek medical attention if irritation develops or persists.
Inhalation: Move to an area free from risk of further exposure. Administer oxygen or artificial respiration as needed. Obtain medical attention. Asthmatic type symptoms may develop and may be immediate or delayed up to several hours. Treatment is essentially symptomatic. Consult physician.
Ingestion: DO NOT INDUCE VOMITING. Give 1 to 2 cups of milk or water to drink. Do not give anything by mouth to an unconscious or convulsing person. Consult physician.

Note To Physician
Eyes: Stain for evidence of corneal injury. If cornea is burned, instill antibiotic/steroid preparation frequently. Workplace vapors could produce reversible corneal epithelial edema impairing vision.
Skin: This compound is known as 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: This compound is known pulmonary sensitizer. Treatment is essentially symptomatic.

An individual having a dermal or pulmonary sensitization reaction to this material should be removed from exposure to any isocyanate.

SECTION 6-EMPLOYEE PROTECTION RECOMMENDATIONS

Precautions must be taken so that persons handling this product do not breathe the vapors or have it contact the skin or eyes. In spray operations, protection must be afforded against exposure to both vapor and spray mist.

Eye Protection: Safety glasses, splash goggles or face shield. Contact lenses should not be worn.
Skin Protection: Chemical resistant gloves. Cover as much of the exposed skin area as possible with appropriate clothing. If skin creams are used, keep the area protected only by the cream to the minimum.
Ventilation And Respiratory Protection: Exhaust ventilation sufficient to keep the airborne concentrations of the solvents, IPDI and Polyisocyanate below their respective TLV's must be utilized. Exhaust air may need to be cleaned by scrubbers or filters to reduce environmental contamination. In addition a respirator that is recommended or approved for use in isocyanate containing environments (air purifying or fresh air supplied) may be necessary. In spray applications, when the airborne isocyanate monomer concentrations are known to be below 0.05 PPM and if the polyisocyanate (polymeric, oligomer) concentrations are known to below 10 MG/M^3, a properly fitted air-purifying (combination organic vapor and particulate) respirator, proven by test to be effective in isocyanate-containing spray paint environments, will provide sufficient protection. When the airborne isocyante concentrations are not known, or if either of the above guidelines is exceeded, or if

spraying is performed in a confined space or area with limited ventilation, the use of a positive pressure supplied air respirator is mandatory. Consider type of application and environment concentrations. Observe OSHA regulations for respirator use (29 CFR 1910.134) even during non-spray operations such as mixing, brush or roller application, etc., depending on the conditions (for example, heating of material or application to a hot substrate), it is possible to be exposed to airborne isocyanate vapors. Therefore, when airborne concentrations during such non-spray operations exceed the intended TLV of 0.005 PPM for isocyanate monomer, but are below 0.05 PPM at least an air purifying (organic vapor) respirator is required. If airborne concentrations are unknown; or exceeded 0.05 PPM; or operations are performed in a confined space, a supplied respirator must be worn. In addition, solvent concentrations should be considered when determining the selection and use of a respirator.

Refer to Patty's Industrial Hygiene and Toxicology- Volume 1 (RD. Addition) chapter 17 and volume III (1st edition) chapter 3- for guidance concerning appropriate air sampling strategy to determine airborne concentrations.

Other .....Safety showers and eyewash stations should be available. Educate and Train employees in safe use of this product.

SECTION 7-SPECIAL PRECAUTIONS & STORAGE DATA

Storage Temperature: Min./Max……-30°F/122°F
Average Shelf Life: 12 Months @ 77°F

Special Sensitivity
Heat, Light, Moisture: If container is exposed to high heat, it can be pressurized and possibly rupture explosively. IPDI reacts slowly with water to form CO_2 gas. This gas can cause sealed containers to expand and possibly rupture explosively.

Precautions To Be Taken
In Handling and Storage: Keep away from heat, sparks and open flame. Store in tightly closed containers to prevent moisture contamination. Do not reseal if contamination is suspected. At maximum storage temperature noted, material may slowly polymerize without hazard. Ideal storage temperature range for ease of handling is 50-81 °F. Avoid contact with skin and eyes. Employee education and training in the safe use and handling of this compound are required under OSHA hazard communication standard.

SECTION 8-SHIPPING DATA

D.O.T. Shipping Name: Other regulated substances, liquid, N.O.S. *See note Below
Technical Shipping Name: Polyisocyanate
D.O.T. Hazard Class: Class 9
UN/NA No: NA 3082
Packing Group: PG III
Product RQ: 6250 lbs. (2835.0 KGS)
D.O.T. Labels Required: Class 9
D.O.T. Placards: Class 9
FRT. Class Bulk: Isocyanate
FRT. Class Pkg: Chemicals NOI (Isocyanate) NMFC 60000.
Product Label: Durothane B

*When in individual containers of less than the product RQ. This material ships as Non-regulated.

State Regulations:
This product does not contain any components that are regulated under California Proposition 65.

SECTION 9-ANIMAL TOXICITY DATA

ACUTE – Based on the same polyisocyanate in different solvents.

Oral, LD 50: Greater than 5 G/KG (Rat)
Inhalation, LC 50: 5018 MG/M3, 4 HR (Rat)
Dermal, LD 50: Greater than 2 G/KG (Rabbit)
Eye Effects: Moderate irritation (Rabbit)
Skin Effects: Moderate irritation (Rabbit)
Sensitization: Skin sensitizer: Negative (Guinea Pigs)

ACUTE – Solvents

Oral, LD 50:	PMA: 8500 MG/KG (Rat)
	Xylene: 4300 MG/KG (Rat)
Inhalation, LC 50:	PMA: 4350 PPM (Rat)
	Xylene: 5000 PPM (Rat, 4H Exp.)
Dermal, LD 50:	PMA: Greater than 1700 MG/KG (Rabbit)
	Xylene: Greater than 1700 MG.KG (Rabbit)
Eye Effects:	PMA: Slight transient injury and irritation (Rabbit)
	Xylene: Mild to severe irritation (Rabbit)
Skin Effects:	PMA: Slight irritation and scaling (Rabbit)
	Xylene: Moderate irritation (Rabbit)
Sensitization:	PMA: Negative (Guinea Pigs)

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