

# Chapter 6

## Material Safety Data Sheet



# What is a Material Safety Data Sheet (MSDS)?

- MSDS used to assess the physical and health hazards of the chemical or product.
- MSDSs must be obtained and maintained for every chemical used in the workplace.
- The Laboratory Standard requires laboratories to keep Material Safety Data Sheets (MSDSs) that are received from the manufacturer.
- The MSDSs must be accessible to all personnel during their work hours.

**What to do with MSDSs and where to find them?**  
Many MSDSs are available via the World Wide Web.



# Understanding MSDS information

- (1) Chemical product and company identification.
- (2) Hazardous Ingredients
- (3) hazards identification
- (4) First Aid measures
- (5) Fire fighting measures
- (6) Accidental release measures
- (7) Handling and storage
- (8) Exposure controls/personal protection
- (9) Physical and chemical properties
- (10) Stability and reactivity
- (11) Toxicological information
- (12) Ecological information
- (13) Disposal consideration
- (14) Transport Information
- (15) Regulatory information
- (16) Other information
- (17) Lable information





## MATERIAL SAFETY DATA SHEET

### 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

**MANUFACTURING LOCATION:**

Rutland Plastic Technologies, Inc.  
10021 Rodney Street  
Pineville, NC 28134  
704/553-0046

**HAZARDOUS MATERIAL INFORMATION SYSTEM:**

Health:	3
Flammability:	1
Reactivity:	2
Personal Protection:	X*

\*see section 8 for PPE

**IN CASE OF EMERGENCY CONTACT:** 704/553-0046

**PRODUCT NAME:** Super Bond  
**CHEMICAL FAMILY:** Silane  
**PRODUCT CODE:** MZ0222

**MSDS NUMBER:** 069  
**DATE REVISED:** 10/9/2006  
**DATE PRINTED:** 7/28/2008  
**SUPERSEDES:** 3/28/2005

**PREPARED BY:** Kimberly C. Leitch (704) 553-0046 ext. 155

### 2. HAZARDOUS INGREDIENTS

HAZARDOUS INGREDIENT	CAS #	% BY WEIGHT	TLV	PEL
Methanol	67-56-1	<3%	200 ppm	200 ppm
Ethylenediamine	107-15-3	<2%	10 ppm	10 ppm

The above ingredients are defined as hazardous by OSHA 29 CFR 1910.1200.

### 3. HAZARDS IDENTIFICATION

**EMERGENCY OVERVIEW:** Danger!  
May cause asthma with possible long-term lung damage.  
Harmful or fatal if swallowed.  
Causes eye burns.  
May cause eye damage or blindness if swallowed.  
May cause allergic skin reaction.  
Cross-sensitization to other amines may occur.  
May cause dizziness and drowsiness.  
May cause heart muscle damage.  
May cause liver and kidney damage.

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### 3. HAZARDS IDENTIFICATION (CONTINUED)

<b>EYE CONTACT:</b>	Causes severe irritation including the following symptoms: discomfort, pain, excessive blinking, tear production, excessive redness of conjunctivae, swelling of conjunctivae, chemical burns of the cornea.
<b>SKIN CONTACT:</b>	May cause mild irritation.
<b>INGESTION:</b>	Contains methanol. Methanol may cause nausea, abdominal pain, vomiting, headache, dizziness, shortness of breath, weakness, fatigue, leg cramps, restlessness, confusion, drunken behavior, visual disturbances, drowsiness, coma, and death. There may be a delay of several hours between swallowing methanol and the onset of symptoms. The effects observed are in part due to acidosis and partially to cerebral edema. Visual effects include blurred vision, diplopia, changes in color perception, restriction of visual fields, complete blindness. Ingestion of moderate quantities of methanol also produces metabolic acidosis. Onset of symptoms may be delayed up to 48 hours. 60-200 ml methanol is a fatal dose for most adults. Ingestion of as little as 10 ml methanol has caused blindness. With massive overdoses, liver, kidney and heart muscle injuries have been described.
<b>INHALATION:</b>	Short-term harmful effects are not expected from vapor generated at ambient temperature; however, this material is capable of forming methanol if hydrolyzed. Methanol vapor may cause dizziness, drowsiness, disturbances of vision, and tingling, numbness, and shooting pains in the hands and forearms. Long-term repeated overexposure to methanol vapor concentrations of 3000 ppm or greater may allow a cumulative effect to occur with resulting nausea, vomiting, headache, ringing in the ears, insomnia, trembling, unsteady gait, vertigo, clouded and double vision. Liver and kidney injury may occur. Prolonged overexposure at levels of 800-1000 ppm may result in severe eye damage.
<b>MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE:</b>	Existing kidney or liver disease, existing dermatitis.
<b>OTHER EFFECTS OF OVEREXPOSURE:</b>	Inhalation of ethylenediamine may cause sensitization of the respiratory tract and the development of an asthmatic reaction on further exposure. There may be susceptible individuals who develop long-term hyper-reactive airways, asthma, and other respiratory injury following exposure to extremely low concentrations of ethylenediamine, even below the irritation threshold. Other respiratory irritants may produce a reaction in individuals whose airways have become hyper-reactive. Since there are no definitive screening methods available to identify susceptible individuals, we suggest that people with asthma, or other longstanding respiratory conditions (for example, chronic bronchitis, emphysema, etc.) should be protected from any potential exposure to ethylenediamine. Skin contact may cause sensitization and an allergic skin reaction. Cross-sensitization may occur by skin contact with this material and other amines.

### 4. FIRST AID MEASURES

**EYES:** Immediately flush with water for 15 minutes. Get medical attention.

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#### 4. FIRST AID MEASURES (CONTINUED)

<b>SKIN:</b>	Remove contaminated clothing. Wash with soap and water. If irritation develops or persists, or if exposure has been prolonged, get medical attention.
<b>INHALATION:</b>	Remove to fresh air for relief. If victim is not breathing, give artificial respiration and get medical attention.
<b>INGESTION:</b>	If victim is conscious, give two glasses of water and induce vomiting. Get medical attention immediately. If medical attention is delayed, and if the victim has swallowed 50 ml or more of this material, give 100 ml of hard liquor. For children, give proportionally less liquor according to weight.
<b>NOTE TO PHYSICIAN:</b>	This product reacts with moisture in the acid contents of the stomach to form methanol. The combination of visual disturbances, metabolic acidosis, and formic acid in the urine is evidence of methanol poisoning. The therapeutic intravenous administration of ethanol (10 ml per hour) allows it to be preferentially oxidized and reduces production of methanol metabolites. Acidosis must be treated by means of intravenous sodium bicarbonate, and methanol elimination may be increased by hemodialysis, as indicated. Treatment should be based on blood methanol levels and acid-base balance. Foliates may be administered to enhance the metabolism of formaldehyde. 4-Methyl pyrazole has been suggested as an antidote: because of its alcohol dehydrogenase inhibiting effects, it reduces the production of formate and the development of metabolic acidosis. However, the value of this antidote remains to be proven in humans.

#### 5. FIRE FIGHTING MEASURES

<b>FLASH POINT (°F):</b>	135° C (280° F) (PMCC)		
<b>OSHA FLAMMABILITY CLASSIFICATION:</b>	None		
<b>EXTINGUISHING MEDIA:</b>	Foam, CO <sub>2</sub> , dry chemical. This material is reactive with water, but the reaction will not significantly increase the fire severity.		
<b>SPECIAL FIRE FIGHTING PROCEDURES:</b>	Do not direct a solid stream of water or foam into hot, burning pools. This may cause frothing and increase fire intensity.		
<b>EXPLOSION LIMITS IN AIR - LOWER (%):</b>	Not available	<b>UPPER (%):</b>	Not available
<b>AUTO IGNITION TEMP (°F):</b>	Not available		
<b>UNUSUAL FIRE AND EXPLOSION HAZARDS:</b>	None known		

#### 6. ACCIDENTAL RELEASE MEASURES

<b>ACTION TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:</b>	Wear proper protective equipment. Dike to contain spill. A large spill may be toxic to fish. Flush with large amounts water and collect for disposal.
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## 7. HANDLING AND STORAGE

<b>HANDLING:</b>	Do not swallow. Do not get in eyes. Avoid breathing vapor. Use with adequate ventilation. Avoid prolonged or repeated contact with skin. Wash thoroughly after handling.
<b>OTHER PRECAUTIONS:</b>	If mixed with water, methanol will be formed; methanol vapors are toxic and flammable so special ventilation may be needed.
<b>STORAGE:</b>	Keep container closed when not in use.

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

<b>ENGINEERING CONTROLS:</b>	Use with adequate ventilation. Special ventilation may be needed if material is mixed or reacted with water.
<b>RESPIRATORY PROTECTION EQUIPMENT:</b>	Self-contained breathing apparatus in high vapor concentrations
<b>PROTECTIVE GLOVES:</b>	Required. Recommended order of use: 4H, Butyl, Neoprene, Nitrile (NBR), PVC-coated.
<b>EYE AND FACE PROTECTION:</b>	Required. Monogoggles recommended
<b>OTHER PROTECTIVE EQUIPMENT:</b>	Apron, long sleeves, long pants.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

<b>Boiling Range/Point:</b>	259° C at STP
<b>Vapor Pressure:</b>	<1.33 hPa at 20° C
<b>Vapor Density (AIR=1):</b>	heavier than air
<b>Melting Point:</b>	<0° C at STP
<b>Physical State:</b>	Liquid
<b>Color:</b>	Clear, pale
<b>Odor:</b>	Amine
<b>% Volatile by Weight:</b>	Not determined
<b>Solubility in Water:</b>	Reacts rapidly
<b>Evaporation Rate (Butyl Acetate=1):</b>	<1
<b>Specific Gravity @ 25° C:</b>	1.0300

## 10. STABILITY AND REACTIVITY

<b>STABILITY:</b>	Stable
<b>HAZARDOUS POLYMERIZATION:</b>	Will not occur
<b>HAZARDOUS THERMAL DECOMPOSITION/COMBUSTION PRODUCTS:</b>	Oxides of carbon, nitrogen, silicon

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### 10. STABILITY AND REACTIVITY (CONTINUED)

**INCOMPATIBILITY (MATERIALS TO AVOID):** Highly reactive with water. The addition of small amounts of water (2-25%) can produce an exothermic reaction which generates alcohol, to the extent that the resulting solution can reach a temperature which exceeds the flash point of the new solution. If a water solution is desired, add the product to the water and not vice versa.

**CONDITIONS TO AVOID:** None known

### 11. TOXICOLOGICAL INFORMATION

**CARCINOGENICITY:** This product is not listed as a carcinogen by NTP, IARC, or OSHA.

**TOXICITY DATA:** Inhalation of vapor generated at room temperature is not acutely toxic. Repeated dermal application produced moderate skin irritation. This material was not genotoxic in a series of in vitro tests or in an in vivo micronucleus test.

**ACUTE ORAL LD50:** >2000 mg/kg

**ACUTE DERMAL LD50:** >2000 mg/kg

**ACUTE INHALATION LC50:** Not determined

### 12. ECOLOGICAL INFORMATION

**ECOTOXICOLOGICAL INFORMATION:** Not determined

**CHEMICAL FATE INFORMATION:** Not determined

### 13. DISPOSAL CONSIDERATIONS

**DISPOSAL METHOD:** Incineration where permitted under appropriate local, state, and Federal regulations.

### 14. TRANSPORT INFORMATION

**DOT SHIPPING NAME:** Not regulated

**DOT HAZARD CLASS:** None

**UN/NA NUMBER:** None

**DOT PACKING GROUP:** None

**AIR FREIGHT TRANSPORTATION:** Not regulated

**OCEAN TRANSPORTATION:** Not regulated

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## 15. REGULATORY INFORMATION

<b>TSCA STATUS:</b>	All components of these products are on the US TSCA inventory.		
<b>CALIFORNIA PROPOSITION 65:</b>	These products do not contain chemicals known to the state of California to cause cancer or birth defects; however, routine analysis for all listed materials is not conducted.		
<b>SARA 302 EXTREMELY HAZARDOUS SUBSTANCES LIST:</b>	None		
<b>SARA (311,312) HAZARD CLASS:</b>	Immediate Health Hazard, Delayed Health hazard		
<b>SARA SECTION 313 TOXIC CHEMICALS:</b>	Methanol	CAS #67-56-1	3%
<b>CARCINOGENS ACCORDING TO NTP, IARC, OR OSHA:</b>	None		
<b>CERCLA RQ:</b>	None		
<b>AUSTRALIAN INVENTORY CHEMICAL SUBSTANCES:</b>	This product (or its components) is listed or exempt from listing on the AICS.		
<b>CANADIAN INVENTORY:</b>	The ingredients of this product are on the DSL.		
<b>EINECS REGULATIONS:</b>	The ingredients of this mixture are on the EINECS inventory.		
<b>JAPAN:</b>	This product (or its components) is listed or exempt from listing on the Existing and New Chemical Substances (ENCS) list.		
<b>KOREAN CHEMICAL INVENTORY:</b>	This product is listed on the Existing Chemical List (ECL).		

## 16. OTHER INFORMATION

**DISCLAIMER OF EXPRESSED AND IMPLIED WARRANTIES:**  
All recommendations and statements made, if any, are based on Rutland's research and experience. However, since Rutland has no control over the conditions of use or storage of the product sold, Rutland cannot guarantee the results obtained through the use of its products. All products are sold and samples are given without any representation or warranty, expressed or implied, of fitness for any particular purpose or otherwise, and upon condition that the buyer shall determine the suitability of the product for its own purposes. This applies also where protective rights of third parties are involved. It does not release the user from the obligation to test the suitability of the product for the intended use and application.

## 17. LABEL INFORMATION

<b>SINGLE WORD:</b>	DANGER!
<b>TARGET ORGANS:</b>	EYES, LIVER, KIDNEY
<b>EYES:</b>	CAUSES EYE BURNS
<b>SKIN:</b>	MAY CAUSE ALLERGIC SKIN REACTION

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## 17. LABEL INFORMATION (CONTINUED)

<b>INHALATION:</b>	MAY CAUSE ASTHMA WITH POSSIBLE LONG-TERM LUNG DAMAGE MAY CAUSE DIZZINESS AND DROWSINESS CROSS-SENSITIZATION TO OTHER AMINES MAY OCCUR
<b>INGESTION:</b>	HARMFUL OR FATAL IF SWALLOWED MAY CAUSE EYE DAMAGE OR BLINDNESS IF SWALLOWED MAY CAUSE HEART MUSCLE DAMAGE MAY CAUSE LIVER AND KIDNEY DAMAGE
<b>HANDLING:</b>	DO NOT SWALLOW DO NOT GET IN EYES AVOID BREATHING VAPOR USE WITH ADEQUATE VENTILATION AVOID PROLONGED OR REPEATED CONTACT WITH SKIN WASH THOROUGHLY AFTER HANDLING
<b>STORAGE:</b>	KEEP CONTAINER CLOSED
<b>ACTION TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:</b>	Wear proper protective equipment. Dike to contain spill. A large spill may be toxic to fish. Flush with large amounts water and collect for disposal.
<b>EXTINGUISHING MEDIA:</b>	Foam, CO <sub>2</sub> , dry chemical. This material is reactive with water, but the reaction will not significantly increase the fire severity.
<b>RIGHT-TO-KNOW CHEMICALS:</b>	METHANOL ETHYLENEDIAMINE

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