

MATERIAL SAFETY DATA SHEET

FORSCH POLYMER CORPORATION
3870 NIAGARA STREET
DENVER, COLORADO 80207

IMPORTANT: BEFORE OPENING ANY FORSCH POLYMER PACKAGES, READ WARNING LABELS AND FOLLOW ALL PRECAUTIONS

TELEPHONE NUMBER: (303) 322-9611

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SECTION 1

FORSCH POLYMER CORP.
3870 NIAGARA STREET
DENVER, CO 80207

PRODUCT NUMBER: FDA LIMITED 88A LIQUID URETHANE
PRODUCT NAME: ISO 110A
CHEMICAL TYPE: ISOCYANATE

EMERGENCY NUMBER: 303-548-7716
DATE OF REVISION: NOVEMBER, 1999

HAZARD RATING: (4) EXTREME (3) HIGH (2) MODERATE (1) SLIGHT (0) INSIGNIFICANT
TOXICITY: 3 FIRE: 1 REACTIVITY: 1 SPECIAL:

SECTION 2

HAZARDOUS COMPONENTS

| | C.A.S. # | PERCENT | (ACGIH) | (OSHA) |
|--|-----------|---------|---------|---------------------|
| VEHICLE : 4,4 DIPHENYLMETHANE DIISOCYANATE | 101-68-8 | | | 0.02 ppm TWA (OSHA) |
| 2,4 DIPHENYLMETHANE DIISOCYANATE | 5873-54-1 | | | NOT LISTED |

MODIFIED MDI'S NOT LISTED
(Ingredients not precisely identified are proprietary or nonhazardous. Values are not product specifications.)

SECTION 3

PHYSICAL DATA

BOILING POINT : DECOMPOSES @ 646 DEG. F, 351.1 DEG. C
VAPOR DENSITY (AIR=1) : 8.5
SPECIFIC GRAVITY : 1.19
SOLUBILITY IN WATER : REACTS
APPEARANCE AND ODOR : PALE YELLOW LIQUID

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SECTION 4

FIRE AND EXPLOSION HAZARD DATA

FLASH POINT : 427 DEG F

EMERGENCY RESPONSE : NOT LISTED IN THE 1990 DOT EMERGENCY RESPONSE GUIDEBOOK

EXTINGUISHING MEDIA : USE WATER SPRAY, DRY CHEMICAL OR CO2 TO EXTINGUISH FIRES.

USE WATER TO KEEP CONTAINERS COOL.

SPECIAL FIRE HAZARDS: A SELF- CONTAINED,BREATHING APPARATUS SHOULD BE AVAILABLE TO FIREMEN.

SECTION 5

HEALTH HAZARD DATA

PRIMARY ROUTES OF ENTRY: EYES, SKIN CONTACT , INHALATION , INGESTION

EYE: This material will probably irritate human eyes following contact.

SKIN: No irritation is likely to develop following short contact periods with human skin. Skin sensitization and/or irritation may develop after repeated and/or prolonged contact with human skin. Data derived from an animal model (guinea pig) demonstrate that dermal exposure to MDI can lead to respiratory sensitization. The data indicates that the greater the amount of MDI skin exposure, the greater the risk of developing respiratory sensitization. The potential for MDI to induce respiratory sensitization in humans and animals by inhalation is well known; however, this recent data indicates that this effect can be induced by skin contact. This data strongly suggests the need for increased emphasis on skin protection.

SKIN ABSORPTION: Systemically toxic concentrations of this product will probably not be absorbed through human skin.

INGESTION: The acute oral LD50 in rat is probably above 10,000 mg/kg. Relative to other materials, a single dose is practically non-toxic by ingestion. Irritation of the mouth, larynx, esophagus and stomach can develop following ingestion.

INHALATION: Vapors and aerosols can irritate eyes, nose and respiratory passages. Severe over exposure may lead to pulmonary edema. MDI can induce respiratory sensitization with asthma-like symptoms similar to those induced by TDI (toluene diisocyanate). Symptoms include chronic cough, tightness of chest with difficulty in breathing. These symptoms may be immediate or delayed up to several hours after exposure. There are reports that chronic exposures may result in permanent decreases in lung function.

OTHER EFFECTS OF OVEREXPOSURE: Recently, a study was completed where groups of rats were exposed for 6 hours / day 5 days/ week for a lifetime to atmospheres of respirable polymeric MDI aerosol. Overall, the tumor incidence, both benign and malignant, and the number of animals with tumors were not different from controls. However, at the top level only (6mg/m3), there was a significant incidence of a benign tumor of the lung (adenoma) and one malignant tumor (adenocarcinoma). There were no lung tumors at 1 mg/m3 and no effects at 0.2 mg/m3. The increased incidence of lung tumors is associated with prolonged respiratory irritation and the concurrent accumulation of yellow material in the lung, which occurred throughout the study. In the absence of prolonged exposure to high concentrations leading to chronic irritation and lung damage, it is highly unlikely that tumor formation will occur.

SECTION 6

REACTIVITY DATA

CHEMICAL STABILITY : STABLE

INCOMPATIBLE MATERIALS: This product will react with any materials containing active hydrogens, such as water, alcohol, ammonia, amines, alkalis and acids. The reaction with water is very slow under 50 Deg C, but is accelerated at higher temperatures and in the presence of alkalis, tertiary amines, and metal compounds. Some reactions can be violent.

HAZARDOUS DECOMPOSITION PRODUCTS: Combustion products: Carbon dioxide, carbon monoxide. Nitrogen oxides, ammonias. Trace amounts of hydrogen cyanide.

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HAZARDOUS POLYMERIZATION: May occur. High temperatures in the presence of alkalis, tertiary amines, and metal compounds will accelerate polymerization. Possible evolution of carbon dioxide gas may rupture closed containers.

SECTION 7 FIRST AID PROCEDURES

SKIN: Wash material off of the skin with plenty of soap and water. If redness, itching, or a burning sensation develops, get medical attention.

EYES: Immediately flush with plenty of water for 15 minutes. If redness, itching, or a burning sensation develops, have eyes examined and treated by medical personnel.

INGESTION: Give 1 or 2 glasses of water to drink. If gastrointestinal symptoms develop, consult medical personnel.

INHALATION: Remove victim to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is labored, give oxygen. Consult medical personnel.

SECTION 8 SPILL OR LEAK PROCEDURES

SPILL OR LEAK PROCEDURES: Wear skin, eye, and respiratory protection during clean up. Soak up material with absorbent and shovel into a chemical waste container. Cover container, but do not seal, and remove from work area. Prepare a decontamination solution of 0.2-0.5% liquid detergent and 3-8% concentrated ammonium hydroxide in water (5-10% sodium carbonate may be substituted for the ammonium hydroxide). Follow the precautions on the supplier's material safety data sheets. All operations should be performed by trained personnel familiar with the hazards of the chemicals used. Treat the spill area with the decontamination solution, using about 10 parts of the solution for each part of the spill, and allow it to react for at least 10 minutes. Carbon dioxide will be evolved, leaving insoluble polyureas.

DISPOSAL METHOD: Slowly stir the isocyanate waste into the decontamination solution described above. Let stand 48 hours, allowing the evolved carbon dioxide to vent away. Neutralize the waste. Neither the solid nor the liquid portion is a hazardous waste under RCRA, 40 CFR 261.

CONTAINER DISPOSAL: Drums must be thoroughly drained to process or storage vessels before removal to an appropriate area for subsequent decontamination. Drums must be decontaminated in properly ventilated areas by personnel protected from the inhalation of isocyanate vapors. Spray or pour 5-15 liters of decontaminating solution and triple rinse the empty container. Puncture or otherwise the rinsed container before disposal. Note that the disposal of spent decontamination solutions may be subject to federal, state, or local regulations, ordinances or conditions of discharge permits. Local regulations should also be consulted before final disposal of decontaminated drums.

SECTION 9 SPECIAL PROTECTION INFORMATION

TLV or suggested control value: No ACGIH TLV or OSHA PEL is assigned to this mixture. Control of exposure to below the PEL for the ingredients (see Section 2) may not be sufficient. Minimize exposure in accordance with good hygiene practice. The ACGIH TLV for MDI is 0.005 ppm 8-hour TWA. The OSHA PEL for MDI is 0.02 ppm, ceiling. NIOSH recommends 0.005 ppm TWA and 0.02 ppm STEL. These control limits do not apply to previously sensitized individuals or to individuals with existing respiratory disease, such as chronic bronchitis, emphysema or asthma.

Sensitized individuals should be removed from any further exposure.

VENTILATION: If needed, use local exhaust ventilation to keep airborne concentrations below the TLV. Follow guidelines in the ACGIH publication "Industrial Ventilation". Exhaust air may need to be cleaned by scrubbers or filters to reduce environmental contamination.

RESPIRATORY PROTECTION: Because of the low vapor pressure, ventilation is usually sufficient to keep vapors below the TLV at room temperatures. Exceptions are when the material is sprayed or heated. If airborne concentrations exceed or are expected to exceed the TLV, use MSHA/NIOSH approved positive pressure supplied air respirator with a

full facepiece, or an air-supplied hood. For emergencies, use a positive pressure self-contained breathing apparatus. Air purifying (cartridge type) respirators are not approved for protection against isocyanates.

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PROTECTIVE CLOTHING: Gloves determined to be impervious under the conditions of use. Depending on conditions of use, additional protection may be required such as apron, arm covers, or full body suit. Wash contaminated clothing before rewearing. Testing of some commercially available clothing indicates that clothing constructed of butyl rubber, nitrile rubber, Saranex coated Tyvek and some neoprene garments have excellent resistance to permeation by MDI.. Clothing constructed of polyethylene, latex rubber, PVC or polylaminted clothing should be selected and used in accordance with "Guidelines for the Selection of Chemical Protective Clothing" published by ACGIH.

EYE PROTECTION: Chemical tight goggles; full faceshield in addition if splashing is possible.

OTHER PROTECTIVE EQUIPMENT: Eyewash station and safety shower in work area.

SECTION 10 SPECIAL PRECAUTIONS OR OTHER COMMENTS

Prevent skin and eye contact. Observe TLV limitations. Avoid breathing vapors or aerosols. Workers should shower and change to fresh clothing after each shift. A sensitized individual should not be exposed to the product which caused the sensitization. Store tightly sealed containers to protect from atmospheric moisture. Store in a cool area. Individuals with existing respiratory disease such as chronic bronchitis, emphysema or asthma should not be exposed to isocyanates. These individuals should be identified through baseline and annual evaluation and removed from further exposure. Medical examinations should include medical history, vital capacity, and forced expiratory volume at one second.

SECTION 11 REGULATORY INFORMATION

TCSA (Toxic Substances Control Act) Regulations, 40 CFR 710: All ingredients are on the TSCA Chemical Substance Inventory.

CEPA (Canadian Environmental Protection Act): All ingredients are on the DSL (Domestic Substances List). CERCLA and SARA Regulations (40 CFR 355, 370, and 372): Section 313 Supplier Notification. This product contains the following toxic chemicals subject to the reporting requirements of Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 and of 40 CFR 372:

50% MDI, listed as Methlenebis (phenylisocyanate), MBI (CAS 101-68-8)

DISCLAIMER

INFORMATION PRESENTED HEREIN HAS BEEN COMPILED FROM INFORMATION PROVIDED TO US BY OUR SUPPLIERS AND OTHER SOURCES CONSIDERED TO BE DEPENDABLE, AND IS ACCURATE AND RELIABLE TO THE BEST OF OUR KNOWLEDGE AND BELIEF BUT IS NOT GUARANTEED TO BE SO. NOTHING HEREIN IS TO BE CONSTRUED AS RECOMMENDING ANY PRACTICE OR USE OF ANY PRODUCT IN VIOLATION OF ANY PATENT OR IN VIOLATION OF ANY LAW OR REGULATION. IT IS THE USER'S RESPONSIBILITY TO DETERMINE THE SUITABILITY OF ANY MATERIAL FOR A SPECIFIC PURPOSE AND TO ADOPT SUCH SAFETY PRECAUTIONS AS MAY BE NECESSARY. WE MAKE NO WARRANTY AS TO THE RESULTS TO BE OBTAINED IN USING ANY MATERIAL AND SINCE CONDITIONS OF USE ARE NOT UNDER CONTROL, WE MUST NECESSARILY DISCLAIM ALL LIABILITY WITH RESPECT TO USE OF ANY MATERIAL SUPPLIED BY US.