Safety Data Sheet (SDS) — R141B

Forane (R) 141b

Source: Arkema Forane 141b MSDS 09 AUG 2005 Rev 12. The official SDS is the printed document supplied with the shipment; if the two differ, the printed version prevails.

1 PRODUCT AND COMPANY IDENTIFICATION

Fluorochemicals EMERGENCY PHONE NUMBERS: Arkema Inc. Chemtrec: (800) 424-9300 (24hrs) or (703) 527-3887 2000 Market Street Medical: Rocky Mountain Poison Control Center (866) 767-5089 (24Hrs) Philadelphia, PA 19103 Information Telephone Numbers Phone Number Available Hrs Product Information 800-245-5858 8:00 am - 5:30 pm (Eastern) Product Name Forane (R) 141b Product Synonym(s) A list of applicable products can be found in Section 16. Chemical Family Hydrochlorofluorocarbons Chemical Formula CH3CCl2F Chemical Name 1,1-dichloro-1-fluoroethane (HCFC - 141b) EPA Reg Num Product Use Foam blowing agent, solvent, aerosol

2 COMPOSITION / INFORMATION ON INGREDIENTS

Ingredient Name CAS RegistryNumber Typical % OSHA 1,1-Dichloro-1-fluoroethane (HCFC-141b) 1717-00-6 100% Y The substance(s) marked with a "Y" in the OSHA column, are identified as hazardous chemicals according to the criteria of the OSHA Hazard Communication Standard (29 CFR 1910.1200) This material is classified as hazardous under Federal OSHA regulation. The components of this product are all on the TSCA Inventory list.

3 HAZARDS IDENTIFICATION

Emergency Overview Clear, colorless liquid and vapor with faint ether odor WARNING! VAPOR REDUCES OXYGEN AVAILABLE FOR BREATHING. HARMFUL IF INHALED AND MAY CAUSE HEART IRREGULARITIES, UNCONSCIOUSNESS OR DEATH. NON-FLAMMABLE VOLATILE LIQUID WHICH MAY CAUSE EYE IRRITATION OR DRYING OF THE SKIN. MAY DECOMPOSE ON CONTACT WITH FLAMES OR EXTREMELY HOT METAL SURFACES TO PRODUCE TOXIC AND CORROSIVE PRODUCTS. Potential Health Effects Skin contact and inhalation are expected to be the primary routes of occupational exposure to this material. Prolonged or repeated contact removes oils from the skin and may dry skin causing irritation, redness and rash. High vapor concentrations are irritating to the eyes and respiratory tract and may result in central nervous system (CNS) effects may be fatal. Inhalation may cause an increase in the sensitivity of the heart to adrenaline, which could result in irregular or rapid heartbeats. Medical conditions aggravated by exposure to this material include heart disease or compromised heart function.

such	**as headache,**	**dizziness, drowsiness**	**and, in severe exposure, loss of**

			consciousness and death. The dense vapor
of this	material may reduce the available oxygen		for breathing. Prolonged exposure to an oxygen-deficient atmosphere

4 FIRST AID MEASURES

IF IN EYES, immediately flush with plenty of water for at least 15 minutes. Get medical attention. IF ON SKIN, flush the area with plenty of water. Remove contaminated clothing and shoes. Wash clothing before reuse. Get medical attention if irritation develops and persists. IF SWALLOWED, do NOT induce vomiting. Give water to drink. Get medical attention immediately. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON. IF INHALED, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention. Do not give adrenaline, epinephrin or similar drugs following exposure to this product.

5 FIRE FIGHTING MEASURES

Fire and Explosive Properties Auto-Ignition Temperature 1022 F / 550 C Flash Point none Flash Point Method TCC Flammable Limits- Upper 15.5 Lower 7.4 Extinguishing Media Use water spray, water fog, carbon dioxide, or dry chemical Fire Fighting Instructions Cool fire exposed containers well after the fire is out to prevent possible explosions. Fire fighters and others who may be exposed to products of combustion should wear full fire fighting turn out gear (full Bunker Gear) and self-contained breathing apparatus (pressure demand NIOSH approved or equivalent). Fire fighting equipment should be thoroughly decontaminated after use. Fire and Explosion Hazards May decompose on contact with flames or extremely hot metal surfaces to produce toxic and corrosive products. Some mixtures of HCFCs and/or HFCs, and air or oxygen may be combustible if pressurized and exposed to extreme heat or flame. Container may explode if heated due to resulting pressure rise.

6 ACCIDENTAL RELEASE MEASURES

In Case of Spill or Leak Use Halogen leak detector or other suitable means to locate leaks or check atmosphere. Keep upwind. Evacuate enclosed spaces and disperse gas with floor-level forced-air ventilation. Exhaust vapors outdoors. Do not smoke or operate internal combustion engines. Remove flames and heating elements.

7 HANDLING AND STORAGE

Handling Do not get in eyes, on skin or clothing. Avoid breathing vapor or mist. Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling. Keep away from heat, sparks and flame. Emptied container retains vapor and product residue. Observe all labeled safeguards until container is destroyed. Do not reuse this container. Do not cut or weld on or near this container. Storage Although this material is stable in long-term storage in carbon steel containers, it may gradually decompose in the presence of ferric chloride. The presence of excess levels of moisture, especially as a separate layer, should be avoided since it may lead to corrosion of carbon steel and formation of ferric chloride. It is recommended that containers be raised above floor or ground during extended storage periods to prevent container corrosion due to standing water. Prior to putting a storage system into service for this product, or after maintenance, ensure that the system is dry and oxygen-free. Purging the system with dry nitrogen is recommended. In addition, containers previously exposed to hydrogen chloride (for example, from impurities in chlorinated blowing agents or solvents), should be thoroughly cleaned first.

8 EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering Controls Investigate engineering techniques to reduce exposures below airborne exposure limits. Provide ventilation if necessary to control exposure levels below airborne exposure limits (see below). If practical, use local mechanical exhaust ventilation at sources of air contamination such as open process equipment. Eye / Face Protection Where there is potential for eye contact, wear chemical goggles and have eye flushing equipment available. Skin Protection Wear appropriate chemical resistant protective clothing and chemical resistant gloves to prevent skin contact. Consult glove manufacturer to determine appropriate type glove material for given application. Wear face shield and chemical resistant clothing such as a rubber apron when splashing may occur. Rinse contaminated skin promptly. Wash contaminated clothing and clean protective equipment before reuse. Wash skin thoroughly after handling. Respiratory Protection Avoid breathing vapor or mist. When airborne exposure limits are exceeded (see below), use NIOSH approved respiratory protection equipment appropriate to the material and/or its components. Consult respirator manufacturer to determine appropriate type equipment for given application. Observe respirator use limitations specified by NIOSH or the manufacturer. For emergency and other conditions where exposure limit may be significantly exceeded, use an approved full face positive-pressure, self-contained breathing apparatus or positive-pressure airline with auxiliary self-contained air supply. Respiratory protection programs must comply with 29 CFR § 1910.134. Airborne Exposure Guidelines for Ingredients Exposure Limit Value 1,1-Dichloro-1-fluoroethane (HCFC-141b) Arkema 8-hour TWA - 500 ppm WEEL TWA - 500 ppm -Only those components with exposure limits are printed in this section. -Skin contact limits designated with a "Y" above have skin contact effect. Air sampling alone is insufficient to accurately quantitate exposure. Measures to prevent significant cutaneous absorption may be required. -ACGIH Sensitizer designator with a value of "Y" above means that exposure to this material may cause allergic reactions. -WEEL-AIHA Sensitizer designator with a value of "Y" above means that exposure to this material may cause allergic skin reactions.

9 PHYSICAL AND CHEMICAL PROPERTIES

Appearance/Odor Clear, colorless liquid and vapor with faint ether odor p H NA Specific Gravity 1.25 @ 50 F/ 10 C Vapor Pressure 10 psia @ 68 F / 20 C Vapor Density 4.0 Melting Point NA Freezing Point -154 F / -103.5 C

Boiling Point 89.6 F / 32 C Solubility In Water Slight Percent Volatile 100 Molecular Weight 116.9

10 STABILITY AND REACTIVITY

Stability This material is chemically stable under specified conditions or storage, shipment and/or use. See HANDLING AND STORAGE section of this MSDS for specified conditions. Incompatibility Avoid contact with hydrochloric acid, alkali or alkaline earth metals, finely powdered metals (aluminum, magnesium, zinc) and strong oxidizers since they may react or accelerate decomposition. Hazardous Decomposition Products Thermal decomposition products include hydrogen fluoride, hydrogen chloride, carbon monoxide, carbon dioxide, chlorine and carbonyl halides. FOR ADDITIONAL IMPORTANT INFORMATION SEE SECTION 16.

11 TOXICOLOGICAL INFORMATION

Toxicological Information Single exposure (acute) studies indicate: Oral - Practically Non-toxic to Rats (LD50 >5,000 mg/kg) Dermal - No More than Slightly Toxic to Rats (LD50 >2,000 mg/kg) Inhalation - Practically Non-toxic to Rats (4-hr LC50 61,647 ppm) Eye Irritation - Non-irritating to Slightly Irritating to Rabbits Skin Irritation - Non-irritating to Rabbits (4-hr and 24-hr exposures) No skin allergy was observed in guinea pigs following repeated exposure. Inhalation of high concentrations produces a transient anesthetic effect in rodents. As with many other halogenated hydrocarbons, inhalation followed by intravenous injection of epinephrine to simulate human stress reactions resulted in heart sensitization in dogs and monkeys. Repeated inhalation studies resulted in minor changes in body weight and slight changes in blood chemistry in rats. Repeated inhalation of vapor produced no evidence of nervous system toxicity or behavioral effects in rats. Long-term inhalation caused an increase in the incidence of benign, non life-threatening tumors of the testes in rats. No birth defects were noted in the offspring of rabbits exposed by inhalation during pregnancy; signs of maternal toxicity were noted. No birth defects were noted in the offspring of rats exposed by inhalation during pregnancy; toxic effects were noted in the mothers and their offspring. In a reproduction study, reductions in litter size, total litter weight and growth rate were observed in rats exposed by inhalation for 2-generations. Delayed sexual maturity of male offspring from exposed parents may have been related to the lower growth rate. Generally, no genetic changes were observed in tests using bacteria, animal cells or animals. Metabolism studies in rats exposed by inhalation show that this material is not metabolized or accumulated in the body to any significant extent.

12 ECOLOGICAL INFORMATION

Ecotoxicological Information This material is slightly toxic to Daphnia magna (48-hr EC50 31.2 mg/l), rainbow trout (24-hr LC50 83.5 mg/l) or algae (EC50 67.8 mg/l). It is practically non-toxic to zebra fish (96-hr LC50 126 mg/l). Chemical Fate Information This material is not readily biodegradable (24% after 28-days). Based on its log Pow of 2.3, bioaccumulation is considered unlikely.

13 DISPOSAL CONSIDERATIONS

Waste Disposal Recover, reclaim or recycle when practical. Dispose of in accordance with federal, state and local regulations. Note: Chemical additions to, processing of, or otherwise altering this material may make this waste management information incomplete, inaccurate, or otherwise inappropriate. Furthermore, state and

local waste disposal requirements may be more restrictive or otherwise different from federal laws and regulations.

14 TRANSPORT INFORMATION

DOT Name NOT REGULATED DOT Technical Name DOT Hazard Class UN Number DOT Packing Group PG RQ DOT Special Information Not regulated when shippped by ground, water, or air.

15 REGULATORY INFORMATION

Hazard Categories Under Criteria of SARA Title III Rules (40 CFR Part 370)

Immediate (Acute) Health Y	**Fire**	**N**
Delayed (Chronic) Health N	Reactive	N
	Sudden Release of Pressure	N

The components of this product are all on the TSCA Inventory list. Ingredient Related Regulatory Information: SARA Reportable Quantities CERCLA RQ SARA TPQ 1,1-Dichloro-1-fluoroethane (HCFC-141b) NE SARA Title III, Section 313 This product does contain chemical(s) which are defined as toxic chemicals under and subject to the reporting requirements of, Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372. See Section 2 1,1-Dichloro-1-fluoroethane (HCFC-141b)

16 OTHER INFORMATION

Revision Information		**Arkema Inc.**
Revision Date	09 AUG 2005	Revision Number 12
Supercedes Revision Dated Revision Summary	25-OCT-2004	

Revised section 8. Key NE= Not Established NA= Not Applicable (R) = Registered Trademark This MSDS applies to the following grades: Forane 141b Forane 141b - SG Forane 141b - HP NFPA HEALTH = 2 FLAMMABILITY = 1 INSTABILITY = 0 Miscellaneous HCFC-141b may gradually decompose in the presence of ferric chloride. Decomposition products include hydrogen chloride which has a corrosive effect on steel, and vinylidene chloride and 1-chloro-1-fluoroethylene which can form carbonyl halides (including phosgene) in the presence of oxygen. Use a high quality or inhibited HCFC-141b, avoid moisture, store in a clean container. Consult the Data Sheet "Forane 141b - Storage and Handling to Prevent Decomposition". Arkema Inc. believes that the information and recommendations contained herein (including data and statements) are accurate as of the date hereof. NO WARRANTY OF FITNESS FOR ANY PARTICULAR PURPOSE, WARRANTY OF MERCHANTABILITY, OR ANY OTHER WARRANTY, EXPRESSED OR IMPLIED, IS MADE CONCERNING THE INFORMATION PROVIDED HEREIN. The information provided herein relates only to the specific product designated and may not be valid where such product is used in combination with any other materials or in any

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