1 PRODUCT AND COMPANY IDENTIFICATION

Thio and Fine Chemicals
Arkema Inc.
2000 Market Street
Philadelphia, PA 19103

EMERGENCY PHONE NUMBERS:
Chemtrec: (800) 424-9300 (24hrs) or (703) 527-3887
Medical: Rocky Mountain Poison Control Center
(866) 767-5089 (24Hrs)

Information Telephone Numbers	Phone Number	Available Hrs
Customer Service	1-800-628-4453	8:30 to 5:30 EST

Product Name	Sec-Butanol
Product Synonym(s)	
Chemical Family	Alcohol
Chemical Formula	C4H100
Chemical Name	2-Butanol
EPA Reg Num	
Product Use	Paint/Varnish/Inks/Synthesis Intermediate/Extraction

2 COMPOSITION / INFORMATION ON INGREDIENTS

Ingredient Name	CAS RegistryNumber	Typical Wt. %	OSHA
Butanol	78-92-2	>or= 99% By Wt.	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
Colorless liquid with an unpleasant odor
WARNING!
FLAMMABLE LIQUID AND VAPOR.
CAUSES EYE IRRITATION.
PROLONGED OR REPEATED CONTACT MAY DRY SKIN AND CAUSE IRRITATION.
MAY CAUSE CENTRAL NERVOUS SYSTEM EFFECTS

Potential Health Effects

Inhalation and skin contact are expected to be the primary routes of occupational exposure to this material. Based on single exposure animal tests, it is considered to be slightly toxic to practically non-toxic if swallowed, no more than slightly toxic if absorbed through skin, practically non-toxic if inhaled, moderately to severely irritating to eyes and practically non-irritating to skin. Prolonged or repeated contact may remove oils from the skin and may dry skin and cause irritation, redness and rash. High vapor concentrations may be irritating to the eyes and respiratory tract, and may result in central nervous system (CNS) effects such as headache, dizziness, nausea, drowsiness and, in severe exposures, loss of consciousness and death. Mild to severe lung injury may occur if this material is drawn into the lungs (aspirated) during swallowing, or during vomiting after swallowing.

4 FIRST AID MEASURES

IF IN EYES, immediately flush with plenty of water for at least 15 minutes. Get medical attention.

IF ON SKIN, immediately flush with plenty of water. Remove contaminated clothing and shoes. Get medical attention. Wash clothing before reuse. Destroy contaminated shoes.

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.

5 FIRE FIGHTING MEASURES

Fire and Explosive Properties

Auto-Ignition Temperature	406 C	
Flash Point	24 C (75 F)	Flash Point Method
Flammable Limits- Upper	9.8%	
Lower	1.7%	

Extinguishing Media

Use water spray, carbon dioxide, foam. Do NOT use water in form of a jet

Fire Fighting Instructions

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

Avoid needless exposures to gas, fume or vapor. If practical, remain upwind when approaching a fire outdoors, even when wearing a respirator.

6 ACCIDENTAL RELEASE MEASURES

In Case of Spill or Leak

Extinguish or turn off all ignition sources. Ventilate the space involved. Wear appropriate personal protection equipment as indicated in Section 8 of this MSDS. Contain spill with inert materials. Construct a dike to prevent spreading. Collect with non-sparking tools to a suitable container. Prevent waterway contamination. Absorb liquid onto inert absorbent and place in DOT approved drums for disposal. Consult a regulatory specialist to determine appropriate state or local reporting requirements, for assistance in waste characterization and/or hazardous waste disposal and other requirements listed in pertinent environmental permits.

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 flames. Use grounding and bonding connection when transferring material to prevent static discharges, fire or explosion.

Storage

Store out of direct sunlight in a cool, well-ventilated place. Store at temperatures below 30 C. Store in a

7 HANDLING AND STORAGE

cool, dry place. Store in well ventilated area away from heat and sources of ignition such as flame, sparks and static electricity. Ensure that all storage and handling equipment is properly rated, grounded and installed to satisfy electrical classification requirements. Static electricity may accumulate and create a fire hazard. All storage containers, including containers such as drums, cylinders and IBC's, must be bonded and grounded during filling and emptying operations. Store away from oxidizers and reactive materials. Keep container tightly closed. Observe all federal, state and local regulations and National Fire Protection Association (NFPA) Codes which pertain to the specific local conditions of storage and use, including OSHA 29 CFR 1910.106 and NFPA 30, 70, 77, and 497.

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 immediately 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
Butanol		
ACGIH TWA	-	100 ppm 303 mg/m3
OSHA TWA PEL	-	150 ppm 450 mg/m3

-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	Colorless liquid with an unpleasant odor
pH	
Specific Gravity	0.807 @ 20 C
Vapor Pressure	1600 Pa @ 20 C
Vapor Density	3.29 KG/M3 @ 20 C
Melting Point	-89 C
Freezing Point	-114.7 C
Boiling Point	99.5 C (211 F)
Solubility In Water	Soluble 125 g/l @ 20 C
Molecular Weight	74.12
Other Physical Data	Log Pow: 0.61

10 STABILITY AND REACTIVITY

Stability

This material is chemically stable under normal and anticipated storage and handling conditions.

Incompatibility

Avoid contact with oxidizers.

Hazardous Decomposition Products

Oxides of carbon and other toxic or irritating gases can be released above boiling point or in a fire.

11 TOXICOLOGICAL INFORMATION

Toxicological Information

Data on this material and/or its components are summarized below.

Butanol

Single exposure (acute) studies indicate that this material is slightly toxic to practically non-toxic if swallowed (rat LD50 2,200-6,500 mg/kg), no more than slightly toxic if absorbed through skin (rat LD50 >2,000 mg/kg), practically non-toxic if inhaled (rat 4-hr LC50 >24.6 mg/l; vapor), moderately to severely irritating to rabbit eyes and practically non-irritating to rabbit skin (24-hr exposure). Acute inhalation by mice produced narcosis. No skin allergy was observed in guinea pigs following repeated exposure. No birth defects were reported in the offspring of rats exposed during pregnancy either orally or by inhalation, even at levels that produced toxic effects on the mothers and offspring. No genetic changes were observed in tests using yeast, bacteria or animal cells.

12 ECOLOGICAL INFORMATION

Ecotoxicological Information

Data on this material and/or its components are summarized below.

Butanol

This material is no more than moderately toxic to lamprey larvae (24-hr LC50 >5.0 mg/l). It is practically non-toxic to goldfish (24-hr LC50 4,300 mg/l), Daphnia magna (24-hr LC50 3,750 mg/l; 48-hr LC50 4,227 mg /l), golden orfe (48-hr LC50 3,520 mg/l), clawed toad (48-hr LC50 1,530 mg/l) and fathead minnow (96-hr LC50 3,670 mg/l). The 8-day no-observable effect level for green algae was 95 mg/l with an EC50 of 8,900 mg/l.

12 ECOLOGICAL INFORMATION

Chemical Fate Information

Data on this material and/or its components are summarized below.

Butanol
This material is readily biodegradable (73.5% after 14-days) and is not expected to bioaccumulate (log Pow 0.61). It is degraded in air by OH radicals (half-life 18.6-hours) and has an evaporation half-life of 3.5-days. It has a slight potential to adsorb onto soil and sediment (log Koc 0.748).

13 DISPOSAL CONSIDERATIONS

Waste Disposal

Recover, reclaim or recycle when practical.

Disposal via incineration is recommended. Appropriate pretreatment and disposal in an authorized landfill is acceptable. In all cases, dispose of material in accordance with all applicable federal, state, and local laws and regulations. Consult appropriate regulatory officials or your attorney for information on such disposal.

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	Butanols
DOT Technical Name	
DOT Hazard Class	3
UN Number	UN1120
DOT Packing Group	PG III
RQ	

15 REGULATORY INFORMATION

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

Immediate (Acute) Health	Y	Fire	Y
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
Butanol	100 LBS	

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

Butanol

Massachusetts Right to Know
This product does contain the following chemicals(s), as indicated below, currently on the Massachusetts Right to Know Substance List.
Butanol

New Jersey Right to Know
This product does contain the following chemical(s), as indicated below, currently on the New Jersey Right-to-Know Substances List.
Butanol

Pennsylvania Environmental Hazard
This product does contain the following chemical(s), as indicated below, currently on the Pennsylvania Environmental Hazard List.
Butanol

Pennsylvania Right to Know
This product does contain the following chemical(s), as indicated below, currently on the Pennsylvania Hazardous Substance List.
Butanol

16 OTHER INFORMATION

Revision Information

Revision Date	07 FEB 2005	Revision Number 1
Supercedes Revision Dated		

Revision Summary
Revised Product ID

Key
NE= Not Established NA= Not Applicable (R) = Registered Trademark