



TAG SOLVENT PRODUCTS (PTY)LTD.

MATERIAL SAFETY DATA SHEET **BUTYL ALCOHOL**

1 CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Common name	: BUTYL ALCOHOL		
Supplier	: TAG Solvent Products Mallet Road/Weg Knights Germiston 1401 Republic of South Africa TEL: +27 11 822-1600		
Synonym	: Sabutol		
Trade name	: Butyl Alcohol		
Material uses	: <i>Coatings</i> – Paints, lacquer thinners, liquid printing inks, flexographic printing and dyes in the foundry industry.		

2 COMPOSITION / INFORMATION ON INGREDIENTS

Name	CAS#	% By Weight	Exposure Limits
1. n-Butanol	71-36-3	65-69	TWA: 50 ppm
2. Isobutyl alcohol	78-83-1	5-12	TWA: 50 CEIL: 75 ppm
3. Pentanol-3	75-85-4	0-4	TWA: 150 CEIL: 225 mg/m ³
4. Pentan-2-ol	6032-29-7	0-1	TWA: 100 STEL: 450 mg/m ³ [1993]
5. sec-Butyl alcohol	78-92-2	0-1	TWA: 100 ppm from OEL [1993]
6. All the constituents of this material are listed on the Australian Inventory of Chemical Substances			TWA: 100 ppm from OSHA [1994]
			TWA: 100 STEL: 125ppm from NIOSH [1992]
			TWA: 150 ppm
			TWA: 450 mg/m ³

3 HAZARDS IDENTIFICATION

Physical state and appearance	: Liquid.
Emergency overview	: Hazardous according to criteria of the National Health and Safety Commission (NIOHSC). Classified as dangerous goods under the criteria of the Australian Dangerous Code (ADG) for transport by road or rail. Xn – Harmful. Xi – Irritant. R10 – Flammable. R20 – Harmful by inhalation. R36-38 – Irritating to eyes and skin. Class 3: Flammable liquid. Poisons Schedule (Australia): Not applicable. Keep away from heat, sparks and flame. Avoid contact with the eyes, skin and clothing. Do not ingest. Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling.
Routes of entry	: Eye contact. Ingestion. Inhalation. Absorbed through skin (skin contact).
Potential acute health effects	
Eyes	: Very hazardous in case of eye contact (irritant). Inflammation of the eye is characterized by redness, watering, itching, blurred vision and inflammation of the cornea.
Skin	: Sensitization of the product: Not available. Hazardous in case of skin contact (irritant, permeator). Severe over-exposure can result in death. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.
Inhalation	: Extremely hazardous in case of inhalation (lung irritant). May be fatal if inhaled.
Ingestion	: Very hazardous in case of ingestion. May be fatal if swallowed.
Potential chronic health effects	: CARCINOGENIC EFFECTS: Classified 4 (Probably not for human) by IARC <small>[sec-butyl alcohol]</small> MUTAGENIC EFFECTS: Not listed. TERATOGENIC EFFECTS: Not listed
Medical conditions aggravated by overexposure	: Persons with pre-existing eye, skin, respiratory, blood and neurological diseases (especially those affecting the EAR) might be at risk from butanol exposure.
Overexposure/signs/Symptoms	: Mild CNS depressant. Vapour may cause headaches, nausea, dizziness, drowsiness, incoordination and confusion. High concentrations may cause unconsciousness and death. Causes skin and eye irritation. NOTE: Aspiration hazard: May be aspirated into lungs during ingestion or vomiting (n-Butanol).

See toxicological information (section 11)

4 FIRST AID MEASURES

Eye contact	: Check for and remove any contact lenses. Immediately flush the eyes with running water for at least 15 minutes, keep eyelids open. Cold water may be used. Do not use eye ointment. Get medical attention.
Skin contact	: In the case of contact, flush the skin with plenty of water. Gently and thoroughly wash the contaminated skin with running water and non-abrasive soap. Be particularly careful to clean folds. Cervices, creases and groin. Cover the irritated skin with an emollient. Wash clothes before reuse. Thoroughly clean shoes before reuse. If irritation persists seek medical attention.
Hazardous skin contact	: Wash with a disinfectant soap and cover skin with an anti-bacterial cream. Seek medical attention.
Inhalation	: If inhaled, remove to fresh air and allow victim to rest. Get medical attention.
Hazardous inhalation	: If inhaled, remove victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is laboured, give oxygen. If not breathing apply artificial respiration. Get medical attention. WARNING! It may be hazardous to the person performing aid to give CPR when inhaled material is toxic, infectious or corrosive. Seek medical attention.
Ingestion	: DO NOT induce vomiting unless directed to do so by medical personnel. Examine the lips and mouth to ascertain whether the tissues are damaged, a possible indication that the toxic material was ingested; the absence of such signs, however, is not conclusive. Loosen tight clothing such as a collar, tie, belt or waistband. If not breathing apply artificial respiration. Get medical attention.
Hazardous ingestion	: No additional information
Notes to physician	: Support respiratory and cardiovascular function.

5	<i>FIRE FIGHTING MEASURES</i>
----------	--------------------------------------

Flammability of the product	: Flammable
Autoignition temperature	: 343°C (649.4°F)
Flash points	: CLOSED CUP: 32°C (89.6°F).
Flammable limits	: LOWER: 1.4% UPPER: 11.2%
Products of combustion	: These products are carbon oxides (CO, CO ₂)
Fire hazards in presence of various substances	: Flammable in the presence of open flames and sparks, of heat and oxidizing materials, Flammable in presence of heat, of reducing materials, of combustible materials. Non-flammable in presence of shocks.
Explosion hazards in presence of various substances	: Highly explosive in presence of open flames and sparks. Slightly explosive in presence of oxidizing materials. Non-explosives in presence of shocks.
Fire fighting media and instructions	: Flammable liquid, soluble or dispersed in water. SMALL FIRE: Use DRY chemicals, CO ₂ , alcohol foam or water spray.. LARGE FIRE: Use alcohol foam, water spray or fog. Cool containing vessels with water jet on order to prevent pressure build-up, autoignition or explosion.
Protective clothing (fire)	: Wear MSHA/NIOSH approved self-contained breathing apparatus or equivalent and full protective gear..
Special remarks on fire hazards	: Vapours may travel to sources of ignition and flash back. Vapours may spread along ground and collect in low or confined areas (sewers, basements, tanks)

Special remarks on explosive hazards	: Vapors may form explosive mixtures with air. May polymerize explosively when heated or involved in fire. Runoff to sewer may create fire or explosion hazard. Containers may explode when heated.
---------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

6 ACCIDENTAL RELEASE MEASURES

Small spill or leak	: Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large spill or leak	: Flammable liquid. Keep away from heat. Keep away from sources of Ignition. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not touch spilled material. Prevent entry into sewers, basements or confined areas; dike if needed. Be careful that the product is not present at a concentration level above TLV. Check TLV on MSDS and with the local authorities

7 HANDLING AND STORAGE

Handling	: Keep locked up. DO NOT ingest. Do not breathe gas, fumes, vapour or spray. In the case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container label. Avoid contact with eyes and skin. Keep away from incompatibles such as oxidizing agents, reducing agents, organic materials, acids and alkalis.
Storage	: Flammable materials should be stored in a separately safety storage cabinet or room. Keep away from heat. Keep away from sources of ignition. Keep container tightly closed. Keep in a cool, well-ventilated place. Ground all equipment containing material. A refrigerated room would be preferable for materials with a flash point lower than 37.8°C (100°F).

8 EXPOSURE CONTROLS, PERSONAL PROTECTION

Engineering controls	: Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapour below their respective threshold limit values. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal protection	
Eyes	: Splash goggles.
Body	: Lab coat.
Respiratory	: Vapour and dust respirator. Be sure to use an MSHA/NIOSH approved respirator equivalent. Wear appropriate respirator when ventilation is inadequate.
Hands	: Butyl rubber gloves.
Feet	: Not applicable.
Protective clothing	: Splash goggles. Lab coat. Vapor respirator. Butyl gloves.
Personal protection in case of large spills	: Splash goggles. Full suit. Vapor and dust respirator. Boots. Gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling the product.

Product Name	Exposure Limits
1. n-Butanol	TWA: 50 ppm
2. Isobutyl alcohol	TWA: 50 CEIL: 75 ppm
3. Pentanol-3	TWA: 150 CEIL: 225 mg/m ³
4. Pentan-2-ol	TWA: 100 STEL: 450 mg/m ³ [1993] TWA: 100 ppm from OEL [1993] TWA: 100 ppm from OSHA [1994] TWA: 100 STEL: 125ppm from NIOSH [1992]
5. sec-Butyl alcohol	TWA: 150 ppm
6. All the constituents of this material are listed on the Australian Inventory of Chemical Substances	TWA: 450 mg/m ³

9 PHYSICAL AND CHEMICAL PROPERTIES

Physical state and appearance	: Liquid.
Colour	: Colourless. Clear. (Light.)
Odor	: Alcohol like. (Slight.)
Taste	: Not available.
Molecular weight	: Not applicable.
Molecular formula	: Not applicable.
PH (1% soln/water)	: 7 [Neutral.]
Boiling/condensation point	: 117°C (242.6°F)
Melting/freezing point	: -89°C (-128.2°F)
Critical temperature	: The lowest known value is 289 °C (553.6°F)(n-Butanol).
Specific gravity	: 0.81(water=1)
Vapor pressure	: The highest known value is 8.8 mm of Hg (@20°C)(isobutyl alcohol). Weighted average: 3.98mm of Hg (@ 20°C).
Vapor density	: The highest known value is 3.04 (Air=1)(Pentanol-3). Weighted average: 2.65 (Air=1).
Volatility	: 100% vlv. (n-Butanol). 100% (w/w). (n-Butanol).
Odor threshold	: The highest known value is 40 ppm (isobutyl alcohol). Weighted average: 26.78ppm.
Evaporation rate	: 0.45(n-Butanol). [Butyl acetate].
VOC	: 100 (%)
Viscosity	: The highest known value is 36.1cP (n-Butanol). Weighted average: 35.16cP.
LogK_{ow}	: The product is equally soluble in oil and water.
Iconicity (in water)	: Not available.
Dispersion properties	: See solubility in water, methanol, diethyl ether, n-octanol.
Solubility	: Easily soluble in methanol, diethyl ether. Soluble in hot water. Partially soluble in cold water, n-octanol.
Physical chemical comments	: No additional remark.

10 STABILITY AND REACTIVITY

Stability and reactivity	: The product is stable.
Conditions of instability	: Heat, sparks, open flames and other ignition sources.
Incompatibility with various substances	: Attacks some forms of rubber, plastics and coatings. Highly reactive with oxidizing agents, reducing agents. Slightly reactive with organic materials
Hazardous decomposition products	: When heated emits acrid smoke and fumes. Usually carbon monoxide is released

Hazardous polymerization	: Will not occur.
---------------------------------	-------------------

11 TOXICOLOGICAL INFORMATION

Toxicity to animals	: WARNING: THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE BASIS OF A 4-HOUR EXPOSURE. Acute oral toxicity (LD50): 790mg/kg [Rat]. (n-Butanol). Acute dermal toxicity (LC50): 5300mg/kg [Rabbit]. (n-Butanol). Acute toxicity of the vapour (LC50): 8000 ppm 4 hour(s) [Rat]. (n-Butanol).
Chronic effects on humans	: The substance is toxic to the lungs, nervous system, skin, eyes, kidneys and liver. Exposure to n-Butanol has been reported to cause auditory nerve and vestibular (hearing impairment, middle part of the ear) injury in some workers exposed to concentrations of 80ppm in combination with unprotected noise exposure for and extended period of time (3-11 years).
Other toxic effects on humans	: Very hazardous in case of skin contact (irritant, permeator), of eye contact (irritant), of ingestion, of inhalation. Slightly hazardous in case of skin contact (sensitizer).
Special remarks on toxicity to animals	: No additional remark.
Special remarks on chronic effects on humans	: Can cause gastrointestinal disturbances. (n-Butanol).
Special remarks on other toxic effects on humans	: Exposure can cause nausea, headache and vomiting. (n-Butanol).

12 ECOLOGICAL INFORMATION

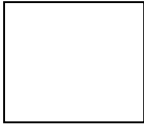
Ecotoxicity	: Not available.
BOD5 and COD	: Not available.
Biodegradable/OECD	: Not available.
Mobility	: Not available. Possibly hazardous short-term degradation products are not likely. However, long-term degradation products may arise.
Products of degradation	: Formaldehyde and Acetic acid.
Toxicity of the products of biodegradation	: The products of degradation are less toxic than the product itself.
Special remarks on the products of biodegradation	: No additional remark.

13 DISPOSAL CONSIDERATIONS

Waste information	: Waste must be disposed of in accordance with federal, state and local environmental control regulations. The recommended disposal method for this product is: <i>incineration</i> .
Waste stream	: RCRA Hazardous Waste: D001, RQ of 100lbs.

Consult your local or regional authorities.

14 TRANSPORT INFORMATION

Dot Classification	: DOT CLASS 3: Flammable Liquid.	
	ALCOHOLS N.O.S. (N-Butanol) UN1987 II	
Marine Pollutant	: Not available	
Hazardous Substances Reportable Quantity	: Not available.	
Special Provisions for Transport	: No additional remarks.	
TDG Classification	: TDG CLASS 3: Flammable liquid.	
ADR/RID Classification	: ADR CLASS 3: Flammable liquid A.	
IMO/IMDG Classification	: IMDG CLASS 3: Flammable liquid.	
ICAO/IATA Classification	: ITAT CLASS 3: Flammable liquid.	

15 REGULATORY INFORMATION

HCS Classification	: HCS Class: Flammable liquid having flash point lower than 37.8°C (100°F). HCS Class: Irritating substance. HCS Class: Target organ effects.
U.S. Federal regulations	: TSCA inventory: N-Butanol; Pentanol-3; Pentan-2-ol; sec-Butyl alcohol; Clean water act (CWA) 307: No products were found. Clean water act (CWA) 311: No products were found. Clean water act (CAA) 112 accidental release prevention: No products were found. Clean water act (CAA) 112 regulated flammable substances: No products were found. Clean water act (CAA) 112 regulated toxic substances: No products were found.
International Regulations WHMIS (Canada)	: WHMIS CLASS B-2: Flammable liquid with a flash point lower than 37.8°C WHMIS CLASS D-2B: Material causing other toxic effects (TOXIC). <u>CEPA toxic substances (schedules 1):</u> Product(s): n-Butanol <u>CEPS DSL:</u> Product(s): Pentanol-3, Pentan-2-ol, sec-Butyl alcohol.
EINECS	: Not available
DSCL (EEC)	: R13 – Flammable. R20 – Harmful by inhalation. R36/38 – Irritating to eyes and skin.
International Lists	: No Products were found

State regulations	: Pennsylvania RTK: N-Butanol; Pentanol-3; Pentan-2-ol; sec-Butyl alcohol. Florida: N-Butanol; Pentanol-3; Pentan-2-ol; sec-Butyl alcohol. Massachusetts: N-Butanol; Pentanol-3; Pentan-2-ol; sec-Butyl alcohol. California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute: n-Butanol.
--------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

16 OTHER INFORMATION

Label requirements	: HIGHLY FLAMMABLE LIQUID AND VAPOUR, VAPOUR MAY CAUSE FLASH FIRE. MAY BE HARMFUL IF SWALLOWED OR INHALED. CONTAINS MATERIAL WHICH CAN CAUSE SPECIFIC ORGAN OR SYSTEM DAMAGE: kidney, lungs, the nervous system, liver, skin, eyes. Cause severe eye irritation. Causes severe skin irritation. CAUSES RESPIRATORY TRACT BURNS
Hazardous material Information System (U.S.A.)	<input type="checkbox"/>
References	: -LOLI Database: The regulated List of Lists. - CHEMINFO: Canadian Centre for Occupational Health and Safety, Issue: 97-3 (August 1997). – BDH; Hazard Data Disk, Version 3. – CESARS: Chemical Evaluation and Retrieval System, Produced by: Ontario Ministry of Environment and Michigan Department of Natural Resources, Issue 97-3 (August 1997). – TOMES Plus System: Toxicology, Occupational Medicine & Environmental Series: incorporating: - MEDITEX, HAZARDTEXT, 1 st Medical Response Protocols, INFOTEXT, HSDB, CHRIS, OHM/TAD, IRIS, NIOSH Pocket Guide, RTECS, NJ Facts Sheets, North American Emergency Response Guides, REPROTEXT, REPROTOX, TERIS, Shepard's Catalog of Teraogenic Agents.
Other special considerations	: No additional remarks.
Date of Printing	: 1 March 2004
Date of issue	: 1 March 2004
Version	
Verified by	

Notice to reader:

This MSDS summarizes at the date of issue our best knowledge of the health, safety and environmental hazard information related to the product, and in particular how to safely handle, use and transport the product in the workplace. Since TAG Solvent Products (PTY) LTD. and its subsidiaries cannot anticipate or control the conditions under which the product may be handled, used, stored or transported, each user must, prior to usage, review MSDS in the context of how the user intends to handle, use, store or transport the product in the workplace and beyond, and communicate such information to all relevant parties. If clarification or further information is required to ensure that an appropriate assessment can be made, the user should contact the company.

We shall not assume any liability for the accuracy or completeness of the information contained herein or any advice given unless there has been gross negligence on our part. In such event our liability shall be limited only to direct damages suffered. Our responsibility for the product as sold is subject to our standards terms and conditions, a copy of which is sent to our customers and is also available upon request. All risk with possession and application of the product passes on delivery.