

# MATERIAL SAFETY DATA SHEET

MSDS No. 02-03  
According to Regulation (EC) No.1907/2006 REACH



## Iso-BUTANOL

Revision: 6 Last up date: July 17, 2008 Date issued: July 21, 1999 Page 1/10



Label No. 3  
Flammable liquide

Xi



Irritant

## 1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

### 1.1. Identification of the substance/preparation

Trade Name	<b>Iso-Butanol</b>
Chemical Name	2-Methyl-1-propanol
Chemical Family	Alcohols
Common Synonyms	Isobutyl Alcohol, Isopropylcarbinol
Chemical Formula	$(\text{CH}_3)_2\text{CH}-\text{CH}_2\text{OH}$
Molecular Weight	74.12

### 1.2. Uses of the substance/preparation

The main use of isobutanol is as raw material in isobutyl acetate manufacture for use in the lacquer industry.

It is used as a flavouring agent in butter, cola, fruit, liquor, rum, and whisky.

Isobutanol is also used in the industrial synthesis of derivative esters.

Other application: solvent in paint, varnish removers and inks, chemical extractant in the production of organic compound, and as mobil phase in thin layer chromatography.

### 1.3. Company/undertaking identification

#### OLTCHIM S.A.

Address	1 Uzinei Street, 240050 - Ramnicu Valcea, Romania
Telephone	+40/250/701200
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e-mail	oltchim @oltchim.ro

**1.4. Emergency telephone number** +40 / 250/738141

## 2. HAZARD IDENTIFICATION

**EC Classification according to Directive 67/548/CEE, Annex I: R10, Xi R 37/38-41, R 67  
Combustible and flammable liquid.**

**Irritating, inhalation may cause narcosis**

**Health effects:** Inhalation of vapors may cause headache, nausea, vomiting, and dizziness, and drowsiness, irritation of respiratory tract and loss of consciousness. Inhalation of vapors may cause temporary narcosis. Liquid may be irritating to skin and eyes. Prolonged skin contact may result in dermatitis. Eye contact may result in temporary corneal damage. Ingestion may cause nausea, vomiting, headache, dizziness, gastrointestinal irritation. Isobutyl alcohol affects central nervous system.

**Environmental effects:** When released into the soil and into the water, this material is expected to quickly evaporate. When released into the air, this material is to be readily degraded by reaction with photochemically produced hydroxyl radicals. This material is not expected to significantly bioaccumulate. No critical hazard to the environment in the ordinary sense of valid regulations. This product is readily biodegradable. No ecological problems are to be expected when the product is handled and used with due care and attention.

**Emergency overview:** : iso-Butanol is a volatile, combustible and flammable liquid that should be stored in well-ventilated areas. Dangerous fire hazard when exposed to heat, flame and oxidizers. Vapor-air mixtures are explosive above flash point.

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## 3. COMPOSITION/INFORMATION ON INGREDIENTS

Hazardous components /constituents	Concentration % ,wt.	CAS No.	EC No.	Annex I Index	Hazard Symbol	Risk phrases
Iso-Butanol	99,5	78-83-1	201-148-0	603-108-00-1	Xi	R10 R37/38 R41 R 67

#### 4 . FIRST - AID MEASURES

*Seek medical attention immediately in all cases of exposure!*

**Inhalation:** Iso-butanol is irritant/narcotic. Inhalation of high concentrations of vapors may cause irritation of the respiratory tract with sore throat, coughing, shortness of breath, headaches, nausea, dizziness, dullness, narcosis and unconsciousness.

Remove to fresh air and rest in half upright position. If not breathing, give artificial respiration. If breathing is difficult give oxygen. Keep person warm and at rest. Call a physician.

**Skin contact:** Irritant. Contact with vapors or liquid may cause mild to moderate irritation and redness. Wash the contaminated skin with plenty of soap or mild detergent and water for at least 15 minutes while removing contaminated clothing and shoes. If irritation persists after washing, get medical attention.

**Eye contact:** Vapors concentration >100ppm may cause irritation, redness pain and blurred vision. Wash the eyes immediately with large amount of water lifting the upper and lower lids, until no evidence of chemical remains at least 15-20 minutes. If irritation persists after washing get medical attention. Contact lenses should not worn with this product.

**Ingestion:** May cause abdominal pain, headache, nausea and diarrhoea. Large doses affect liver and kidneys. May have narcotic effect. Ingestion may also lead to alcohol poisoning.

Remove ingested material by gastric lavage or emesis. Give artificial respiration with oxygen if respiration is depressed. Get medical attention. **Administration of gastric lavage is permitted only by qualified medic personnel.**

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#### 5. FIRE - FIGHTING MEASURES

**Suitable extinguishing media:** Dry chemical powder extinguishers are recommended. These are particularly useful when fires involve "live" electrical equipment, because the powder is non-conducting. For a small fire, use carbon dioxide, dry chemical powder, alcohol-resistant foam, sand, earth, or water spray. Do not use water in a jet. For a large fire, use alcohol-resistant foam, or water fog.

**Unsuitable extinguishing media:** Do not use water streams, since the streams will scatter and spread the fire. For maintaining the tanks cool, use sprayed water.

**Exposure hazards:** iso-Butanol is a combustible and flammable liquid, sensible to static discharges. Dangerous fire hazard when exposed to heat and flame. Vapor-air mixtures are explosive above flash point. In the event of a fire, move the containers from fire area if you can do it without risks. Apply cooling water to sides of containers that are exposed to flames until well after fire is out. Stay away from ends of tanks. For massive fire in cargo area, use unmanned hose holder or monitor nozzles; if this is impossible, withdraw from the area and let fire burn. Withdraw immediately in case of rising sound from venting safety device or any discoloration of tank due to. Isolate for 1/2 mile in all directions if tank, rail car or tank truck is involved in fire.

**Protection of fire-fighters:** In the event of a fire, wear full protective clothing and an approved self-contained breathing apparatus with full face piece operated in the pressure demand or other positive pressure mode.

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## 6. ACCIDENTAL RELEASE MEASURES

**Personal precautions:** Ventilate area of leak or spill. Persons performing clean-up work should wear adequate personal protective equipment and a self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode. Keep unnecessary and unprotected personnel from entering. Remove all sources of ignition.

**Environmental precautions:** Stop leak and use water spray to reduce vapors. Prevent from contamination the ground and the surface waters by isolating the hazard area. Contain and recover liquid when possible. Keep closed containers and dispose according to all applicable federal, state or local environment regulations

**Methods of cleaning up:** Contain and recover liquid when possible. Use water spray to reduce vapors.

**For small spills:** absorb the spilled liquid with sand, earth or other absorbent material (e.g. vermiculite) and place in a chemical waste container for subsequent disposal by burning. Flush the contaminated area with plenty of water.

**For large spills:** Prevent spilled liquid from spreading by the use of sand or earth. If possible, transfer the liquid to a salvage tank. Otherwise, treat as for a small spillage. Inform the local authorities (particularly the fire service) at once, if the spilled liquid enters the surface drains, since a potential explosive hazard will be created.

**Special precautions:** Do not use combustible materials as absorbent, such as saw dust. Do not flush to sewer! Use only non-sparking tools and equipment.

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## 7. HANDLING AND STORAGE

**Handling:** Protect against physical damage. Sources of ignition such as smoking and open flames are prohibited where iso-butanol is used, handled or stored in a manner that could create a potential fire or explosion hazard. Metal containers should be bonded and grounded for transfers to avoid static sparks. When handling this product use non-sparking type tools and equipment, including proof ventilation. Do not use compressed air or oxygen for filling, discharging or handling. The personnel which handling the product must wear protective equipment.

**Storage:** Store in a cool, dry well-ventilated location, away from any area where fire may be acute. Outside or detached storage is preferred. Separate from incompatibles. Storage and use area should be No Smoking areas. Drums must be equipped with self-closing valves, nitrogen blanket. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.

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## 8 . EXPOSURE CONTROLS / PERSONAL PROTECTION

### Exposure limits

Long-term exposure limit (8-hour TWA reference period): 50 ppm

Short-term exposure limit (15-minute reference period): 75 ppm

**Exposure controls :** A system of local and/or general exhaust is recommended to keep employee exposure as low as possible. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its sources, preventing dispersions of it into the general work area. Ventilation equipment should be explosion- proof if explosive concentration of vapors or fume are present.

**Respiratory protection:** If the exposure limit is exceeded, a full face piece respirator with organic vapor cartridge may be worn up to 50 times the exposure limit or the maximum use concentration specified by the appropriate regulator agency or respirator supplier, whichever is lowest. For emergencies or instances where the exposure levels are not known, use a full face piece positive pressure, air-supplied respirator. *WARNING! Air purifying respirators do not protect workers in oxygen-deficient atmospheres.*

**Hand protection :** Wear nitrilic rubber gloves.

**Eye / Face protection :** Use chemical safety goggles and/or a full face shield when is possible. Avoid using contacy lenses at work. The working area will be equipped with eyewash fountains.

**Skin protection:** Wear impervious protective clothing (full suit), including boots, lab coat, apron or coveralls, as appropriate, to prevent skin contact. The protective equipment contaminated with 1-butanol will be immediately took out and washed. The contaminated equipment will not be stored near clean clothings and in will not be took home because the family member must not be exposed.

**Environmental Exposure Control:** It is recommendable to develop a monitoring plan in order to maintain the releases in the environment below the maximum allowed concentrations, complying with local, regional, regional and national legislation.

**Other precautions:** Maintain shower, eye wash fountain and quick-drench facilities in work area.

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## 9. PHYSICAL AND CHEMICAL PROPERTIES

### General informations

Appearance Clear colorless liquid

Odor Alcohol like

### Important health, safety and environmental informations

pH 7 (for 85 g/l solution at la 20°C)

Boiling point 106-108° C

Flash point 28°C

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Flammability	Flammable
Explosive properties	Explosive under open flame Explosive limits in air: 1,6-12% vol
Oxidizing properties	No oxidizing properties
Vapor pressure at 25 °C	10.4 mmHg
Specific gravity (water=1) at 20° C	0,802
Solubility - water	85 g/l
-ethanol, ether	freely soluble
Partition coefficient (log K <sub>ow</sub> )	0,79 la 25° C
Dynamic viscosity at 20° C	4 mPas
Vapor relative density (air=1)	2,6
Evaporation rate (BuAc=1)	0.8

**Other informations**

Melting point	-108° C
Autoignition temperature	415 °C

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## 10. STABILITY AND REACTIVITY

**Chemical stability:** Stable under ordinary conditions of use and storage.

**Conditions to avoid:** Heat, flame, sources of ignition and incompatibles.

**Materials to avoid**

- alkali metals: reacts with formation of flammable hydrogen gas;
- aluminum (metallic): may react at high temperatures;
- inorganic acids: hazardous of explosion;
- oxidizers (strong): reacts with formation of flammable hydrogen gas;
- plastics, rubber, coatings: attacked;
- acetaldehyde: violent condensation reaction;
- isocyanates: possible explosion in absence of solvent;
- chlorine: formation of highly explosion alkyl hypochlorites.

**Hazardous decomposition products :** Thermal decomposition products include carbon monoxide and dioxide. May produce irritating and corrosive fumes when heated to decomposition.

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## 11. TOXICOLOGICAL INFORMATION

**Animal toxicity data:**

LD <sub>50</sub> /Oral, rat	> 2830 mg/kg
LC <sub>50</sub> /Inhalation, rat	> 24 mg/l/4 h
LC <sub>50</sub> /Dermal, rat	> 2000 mg/kg

### Acute toxicity

- **Inhalation:** Iso-butanol is irritant/narcotic. Inhalation of high concentrations of vapors may cause irritation of the respiratory tract with sore throat, coughing, shortness of breath, headaches, nausea, dizziness, dullness, narcosis and unconsciousness.
- **Skin contact:** Irritant. Contact with vapors or liquid may cause mild to moderate irritation and redness. The substance caused slight erythema and hyperemia but without the formation of wheals.
- **Eye contact:** Vapors concentration >100ppm may cause irritation, redness pain and blurred vision.
- **Ingestion:** May cause abdominal pain, headache, nausea and diarrhoea. Large doses affect liver and kidneys. May have narcotic effect.

**Chronic effects:** Prolonged inhalation has caused auditory nerve and vestibular injury resulting in severe vertigo and hearing loss in workers exposed to iso-Butanol. Repeated or prolonged contact may decrease the skin resulting in drying, cracking and eczematoid dermatitis. Person with pre-existing skin disorders or eye problems or impaired liver, kidney or respiratory function may be more susceptible to the effects of the substance.

### CMR effects (Carcinogeny, Mutagenicity, toxicity for Reproduction):

**Carcinogeny:** No reliable data are available.

**Mutagenicity:** Several in vitro mutagenicity studies indicate that isobutanol is not a genotoxicant.

**Toxicity for Reproduction:** Isobutanol did not cause any reproductive toxicity in two-generation reproductive toxicity test.

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## 12. ECOLOGICAL INFORMATIONS

### Ecotoxicity

Fish	<i>P. promelas</i>	LC <sub>50</sub> =1430mg/l/96 hours
Daphnia	<i>Daphnia magna</i>	EC <sub>50</sub> =1439mg/l/48 hours
Algae	<i>Desmodesmus subspicatus</i>	IC <sub>50</sub> =1250mg/l/48 hours
Bacteria	<i>E. sulcatum</i>	EC <sub>5</sub> =295mg/l/72hours

**Mobility:** When release to water, this material is slowly soluble and float on the water level. With regard with the vapour pressure value and water solubility of the isobutanol volatilization from water are expected to be moderate.

Isobutanol is not expected to hydrolyze in water due to the absence of hydrolysable groups.

When release in the soil, this material will both evaporate and leach into ground water due to its relatively high vapor pressure and low absorption to the soil.

In air isobutanol is removal by an photochemical reaction.

**Persistence and degradability:** The half time in the river water is 4 days. In the air, the half time is 20 hours. Biodegradation: 99 % after 14 days.

The photochemical removal of isobutanol from troposphere occurs by reaction with hydroxyk radicals.

**Bioaccumulative potential:** With regard of the value of  $\text{Log } K_{ow}=0.79 < 1$ , no bioaccumulation is to expected.

**PBT assessment:** Not applicable.

**Other adverse effects:** Isobutanol has a slight acute toxicity to aquatic life. Insufficient data are available to evaluate or predict the long term effects of isobutyl alcohol to plants, birds, or land animals.

*Do not allow to enter waters, waste water or soil!*

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### 13. DISPOSAL CONSIDERATIONS

**Waste treatment:** What ever cannot be saved for recovery or recycling should be handled as hazardous waste. Dispose of contaminated product, container residues and spill clean up materials in accordance with federal, state and local requirements.

Incineration is the recommended method. Wastes should be sprayed into the furnace. Incineration is more efficient if the wastes are mixed with a more flammable liquid.

**Packaging treatment:** The empty containers are treated with steam and rinsed with plenty of water. The resulted effluent are treated in the same way as waste. The empty and clean containers are to be reused in conformity with regulations.

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### 14. TRANSPORT INFORMATION

Iso-butanol can be shipped according to transport regulations for dangerous goods, hazard class 3, Flammable liquids.

#### Transport Labeling



Label no.3  
Flammable liquids

#### RID/ADR

UN No.	1212
Proper shipping name	iso-Butanol
Hazard class	3
UN Packing Group	III
Classification code	F1



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Wear suitable gloves and eye/face protection.

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If swallowed, seek medical advice immediately and show this container or label.

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## 16. OTHER INFORMATION

### List of relevant R-phrases (see chapter 3)

- R10** Flammable  
**R37/38** Irritating to respiratory system and skin.  
**R41** Risk of serious damage to eyes.  
**R67** Vapors may cause drowsiness and dizziness.

**Precautions to be taken in handling and storing:** Keep well ventilated the areas where iso-butanol is stored and handled.

**Work hygienic practices:** Avoid direct contact of substance with skin/eyes. Avoid the exposure of personnel with liver affections.

**Interdictions:** **Do not drink or eat** in working area.

**Do not smoke** in or near working area.

**The use of open flame** in working areas is prohibited.

**MSDS Revisions:** This Material Safety Data Sheet is made in accordance to European Directive and will replace the previous version 5 dated January 30, 2008.

### Revised information:

TÜV mark for Quality-Environmental Integrated System was replaced with the new one, remitted by TÜV Management GmbH.

Sources of key data uses to compile the data sheet:

EC Directive 67/548/EC resp. 99/45/EC as amended in each case.

EC Directive 2001/58/EC as amended in each case.

EC Directive 2000/39/EC as amended in each case.

National Threshold Limit Values of corresponding countries as amended in each case.

Transport regulations according to ADR, RID, IMDG, IATA as amended in each case.

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*This MSDS has been elaborated in accordance with Regulation (EC) No. 1907/2006 REACH..  
The information contained here in is based on the present state of our knowledge. It characterizes the product with regard to the appropriate safety precautions. It does not represent a guarantee of the properties of the product.*

*This MSDS cannot cover all possible situations which the user may experience during handling and processing. Each aspect of the user's operation should be examined to determine if, or where, additional precautions may be necessary. All health and safety information contained within this MSDS should be provided to the user's employees or customers.*