SIBUR-KHIMPROM JSC

SAFETY DATA SHEET
According to 1907/2006/EC, article 31 (REACH)

n-BUTANOL

1 IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND COMPANY/UNDERTAKING

PRODUCT NAME butan-1-ol
SYNONYMS Butyl alcohol, 1-butanol, propyl carbinol
TRADE NAMES n-butanol
SUPPLIER SIBUR-KHIMPROM JSC
Promishlennaya str. 98
614055 Perm
Russian Federation
Phone +7 (3422) 90-83-72; 90-84-84; 90-82-82
Fax +7 (3422) 90-81-61; 90-86-60
Email mail@siburperm.ru

EMERGENCY TELEPHONE +7 (3422) 90-87-05 (round the clock)
+7 (3422) 90-86-79, 290-87-18 (English, German, 5 AM to 1 PM CET, leave the message)

2 HAZARDS IDENTIFICATION

n-Butanol is used as industrial feedstock for further synthesis, as organic solvent, etc.

LABELLING Xn (harmful)

CLASSIFICATION
n-Butanol is classified as flammable, harmful and irritant.

3 COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Name</th>
<th>EC-No</th>
<th>CAS-No</th>
<th>Content</th>
<th>Classification</th>
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<tbody>
<tr>
<td>n-butanol</td>
<td>200-751-6</td>
<td>71-36-3</td>
<td>≥99%</td>
<td>R10, Xn; R22, Xi; R37/38-41, R67</td>
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</tbody>
</table>
The product does not contain impurities or additives that could affect product’s labelling and classification. The Full Text for all R-Phrases is displayed in Section 16.

COMPOSITION COMMENTS
The Data shown are in accordance with the latest EU Directives.

4 FIRST-AID MEASURES

INHALATION
Move any exposed person to fresh air at once. Keep warm and at rest. If there is respiratory distress give oxygen. If respiration stops or shows signs of failing, apply artificial respiration. Get medical attention immediately.

INGESTION
Potential for aspiration if swallowed. Get medical aid immediately. Wash out mouth with water and give plenty of water to drink, provided person is conscious. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If vomiting occurs naturally, have the exposed person lean forward.

SKIN CONTACT
Remove contaminated clothing and wash skin with plenty of running water, under a shower if affected area is large enough to warrant this. Get medical attention if irritation develops or persists.

EYE CONTACT
Rinse immediately eye with plenty of low pressure water for at least 15 minutes. Remove any contact lenses. Get medical attention immediately.

5 FIRE-FIGHTING MEASURES

EXTINGUISHING MEDIA
Flammable liquid and vapour.
For small fires, use dry chemical, carbon dioxide, water spray or foam. For large fires, use water spray. Do NOT use straight streams of water. Material is lighter than water and a fire may be spread by the use of water.

SPECIAL FIRE FIGHTING PROCEDURES
Use flooding quantities of water to keep fire-exposed containers cool.

UNUSUAL FIRE & EXPLOSION HAZARDS
Vapour may cause flash fire.
Vapours are heavier than air. It may travel along the ground and be ignited at a distant location. The vapour readily mixes with air and explosive mixtures can easily be formed.

SPECIFIC HAZARDS
Combustion generates irritating and highly toxic fumes.
PROTECTIVE MEASURES IN FIRE
Wear full protective clothing and MSHA/NIOSH-approved self-contained breathing apparatus with full face piece operated in the pressure demand or other positive pressure mode.

### 6 ACCIDENTAL RELEASE MEASURES

**PERSONAL PRECAUTIONS**
See section 8.

**ENVIRONMENTAL PRECAUTIONS**
Take precautionary measures against discharges into the environment.

**SPILL CLEAN UP METHODS**
Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Clean up spills immediately, observing precautions in the Protective Equipment section. Remove all sources of ignition. Use a spark-proof tool. Provide ventilation.

### 7 HANDLING AND STORAGE

**USAGE PRECAUTION**
Wash thoroughly after handling. Use only in a well-ventilated area. Ground and bond containers when transferring material. Avoid contact with eyes, skin, and clothing. Empty containers retain product residue, (liquid and/or vapour), and can be dangerous. Keep container tightly closed. Keep away from heat, sparks and flame. Take precautionary measures against static discharges. Avoid ingestion and inhalation. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames.

**STORAGE PRECAUTIONS**
Keep away from heat, sparks, and flame. Keep away from sources of ignition. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Flammables-area.

### 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

**EXPOSURE LIMITS**
- NIOSH 1400 ppm IDLH
- OSHA 100 ppm (300 mg/m³) TWA
- ACGIH 20 ppm

**PROTECTIVE EQUIPMENT**
Protective gloves, safety goggles and protective clothing.

**RESPIRATORY EQUIPMENT**
Wear positive pressure self-contained breathing apparatus if exposure limits are exceeded or if irritation or other symptoms are experienced.
HAND PROTECTION
Wear appropriate protective gloves to prevent skin exposure.

EYE PROTECTION
Wear approved safety goggles.

HYGIENE MEASURES
Wash at the end of each work shift and before eating, drinking, smoking or using the toilet.

SKIN PROTECTION
Wear protective clothing.

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<td>ODOR</td>
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<td>FLASH POINT</td>
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<tr>
<td>EXPLOSION LIMITS</td>
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<td>AUTOIGNITION TEMPERATURE</td>
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<td>MELTING POINT</td>
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<td>BOILING POINT</td>
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<td>SPECIFIC GRAVITY (LIQUID)</td>
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<th>10 STABILITY AND REACTIVITY</th>
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<tr>
<td>STABILITY</td>
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<tr>
<td>MATERIALS TO AVOID</td>
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<td>CONDITIONS TO AVOID</td>
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<tr>
<td>HAZARDOUS DECOMPOSITION PRODUCTS</td>
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11 TOXICOLOGICAL INFORMATION

GENERAL
Draize test, rabbit, eye: 2 mg Severe;
Draize test, rabbit, eye: 2 mg/24H Severe;
Draize test, rabbit, skin: 405 mg/24H Moderate;
Draize test, rabbit, skin: 20 mg/24H Moderate;
Inhalation, rat: LC50 8000 ppm/4H;
Inhalation, rat: LC50 24000 mg/m³/4H;
Oral, mouse: LD50 100 mg/kg;
Oral, rabbit: LD50 3484 mg/kg;
Oral, rabbit: LD50 3400 mg/kg;
Oral, rat: LD50 790 mg/kg;
Oral, rat: LD50 800 mg/kg;
Skin, rabbit: LD50 3400 mg/kg;

INHALATION
Causes respiratory tract irritation. May cause cardiovascular disturbances, hearing abnormalities, central nervous system depression, muscle weakness, and possible death due to respiratory failure. May be absorbed through the lungs.

INGESTION
May cause central nervous system depression, characterized by excitement, followed by headache, dizziness, drowsiness, and nausea. Advanced stages may cause collapse, unconsciousness, coma and possible death due to respiratory failure. Aspiration hazard. Aspiration of material into the lungs may cause chemical pneumonitis, which may be fatal. May be harmful if swallowed.

SKIN CONTACT
Causes skin irritation. Skin absorption is slight. Repeated or prolonged exposure may cause drying and cracking of the skin. Although n-butanol can enter the circulation after topical application, the absorbed dose is insignificant compared to that from other routes.

EYE CONTACT
Causes severe eye irritation. May cause corneal oedema and inflammation. May cause lacrimation (tearing), blurred vision, and photophobia. Vapours appear to cause a special vacuolar keratopathy in humans.

12 ECOLOGICAL INFORMATION

ECOTOXICITY
Fish: Fathead Minnow: LC50 1510-1730 mg/L; 96 H;
Static bioassay at 24.7 °C (pH 7.64) Water flea Daphnia: EC50 1980-1983 mg/l; 48 H;
Unspecified Bacteria (Phytobacterium phosphoreum): EC50 2817-3710 mg/l; 5H30 min.;

Microtox test Release of n-butanol to soil may result in volatilization from the soil surface and biodegradation is expected to be significant. n-Butanol should not bind strongly to soil and so is
expected to leach into groundwater. Release of n-butanol to water is expected to result in biodegradation and in volatilization from the water surface. Photooxidation by hydroxyl radicals is expected to be slow.

WATER HAZARD CLASSIFICATION
According to the German VwVwS: WGK- 1 (low danger for water pollution)

### 13 DISPOSAL CONSIDERATIONS

**GENERAL INFORMATION**
Place into a suitable closed container for disposal.

**DISPOSAL METHODS**
Dispose of in accordance with local and national regulations. DO NOT CUT, DRILL, GRIND, WELD OR PERFORM SIMILAR OPERATIONS ON OR NEAR CONTAINERS EVEN WHEN EMPTY.

### 14 TRANSPORT INFORMATION

**GENERAL**
The product is covered by international regulations on the transport of dangerous goods under UN DOT, hazard class 3.3 (flammable liquid).

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CHRIS code: BAN
CHRIS compatibility group: 20; alcohols, glycols

USCG regulated: yes
USCG flammable/combustible cargo: yes
USCG flammability/combustibility grade: D

### 15 REGULATORY INFORMATION

**LABELLING**
Xn (harmful)

**CONTAINS**
n-butanol (≥99%)

**RISK PHRASES**
- R10 Flammable
- R22 Harmful if swallowed
REVISION DATE: 16/03/2010

R37/38 Irritating to respiratory system and skin
R41 Risk of serious damage to eyes
R67 Vapours may cause drowsiness and dizziness

SAFETY PHRASES
S2 Keep out of the reach of children
S7/9 Keep container tightly closed and in a well-ventilated place
S13 Keep away from food, drink and animal feeding stuffs
S26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice
S37/39 Wear suitable gloves and eye/face protection
S46 If swallowed, seek medical advice immediately and show this container or label

UK REGULATORY REFERENCES

ENVIRONMENTAL LISTING
Control of Pollution Act 1974.

EU DIRECTIVES
System of specific information relating to Dangerous Preparations. 2001/58/EC. Dangerous Preparations Directive 1999/45/EC.

STATUTORY INSTRUMENTS

APPROVED CODE OF PRACTICE
Classification and Labelling of Substances and Preparations Dangerous for Supply (EU 2001/59/EC). Safety Data Sheets for Substances and Preparations (REACH)

GUIDANCE NOTES
Workplace Exposure Limits EH40. Introduction to Local Exhaust Ventilation HS(G)37. CHIP for everyone HSG(108).

NATIONAL REGULATIONS
Workplace Exposure Limits 2005 (EH40).
The Carriage of Dangerous Goods and use of transportable pressure equipment regulations 2004. Control of Substances hazardous to health regulations 2002 (as amended).

NATIONAL REGULATIONS (GERMANY)
Major Accident Hazard Legislation 82/501/EWG.
16 OTHER INFORMATION

ISSUED BY    HS&E Manager

REVISION DATE:  16/03/2010

RISK PHRASES    IN FULL
R10     Flammable
R22     Harmful if swallowed
R37/38   Irritating to respiratory system and skin
R41     Risk of serious damage to eyes
R67     Vapours may cause drowsiness and dizziness

DISCLAIMER

This document is of an informative character. The information given herein is based on the present state of our knowledge and experience. It guarantees neither the product properties nor the quantitative parameters and cannot be used as a basis for any claim. The information provided cannot be used for any mixtures with any other substances. Product should be transported, stored and used in accordance with valid regulations and good occupational hygiene practice. Making use of the information as well as product application is beyond the control of the producer and determining the safe conditions of use is the sole responsibility of the customer.