

# tert-Butanol

## Safety Data Sheet

according to Regulation (EU) 2015/830

Date of issue: 05/04/2017

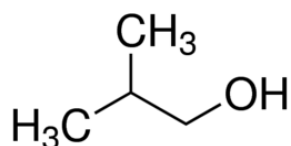
Doc No: SDS-908.032/0



### SECTION 1: Identification of the substance/mixture and of the company/undertaking

#### 1.1. Product identifier

Product form : Substance  
Substance name : tert-Butanol  
EC Index-No. : 603-005-00-1  
EC-No. : 200-889-7  
CAS-No. : 75-65-0  
Type of product : Pure substance  
Formula : C<sub>4</sub>H<sub>10</sub>O  
Chemical structure :



Synonyms : 1,1-dimethylethanol / 2-methylpropan-2-ol / 2-methylpropanol-2 / 2-propanol, 2-methyl- / Butanols / dimethylethanol / methanol, trimethyl- / NA1120 / pesticide code: 001505 / PST22630 / STCC4909130 / TBA (=tert-butyl alcohol) / t-butanol / t-butyl alcohol / t-butyl hydroxide / tert-butyl alcohol / tert-butyl hydroxide / tertiary-butanol / tertiary-butyl alcohol / tertiary-butyl hydroxide / trimethyl carbinol / trimethyl methanol / 2-methyl-2-propanol

#### 1.2. Relevant identified uses of the substance or mixture and uses advised against

##### 1.2.1. Relevant identified uses

Use of the substance/mixture : Laboratory chemical  
Solvent  
Fuel: additive  
Chemical raw material  
Cleaning product: component  
Pesticide: component  
Stabilizer

##### 1.2.2. Uses advised against

No additional information available

#### 1.3. Details of the supplier of the safety data sheet

ISOLAB GmbH  
Bahnhofstrasse 10, D-97877  
Wertheim - Germany  
T +49 93 42 912 355 - F +49 93 42 912 357  
[prodsafe@isolab.de](mailto:prodsafe@isolab.de)

#### 1.4. Emergency telephone number

| Country | Organisation/Company   | Address                           | Emergency number | Comment |
|---------|--|-----------------------------------|------------------|---------|
| Germany | Giftnotruf der Charité<br>CBF, Haus VIII (Wirtschaftgebäude), UG | Hindenburgdamm 30<br>12203 Berlin | +49 30 19240     |         |

### SECTION 2: Hazards identification

#### 2.1. Classification of the substance or mixture

##### Classification according to Regulation (EC) No. 1272/2008 [CLP]

Flam. Liq. 2 H225  
Acute Tox. 4 (Inhalation) H332  
Eye Irrit. 2 H319  
STOT SE 3 H335

Full text of hazard classes and H-statements : see section 16

##### Adverse physicochemical, human health and environmental effects

No additional information available

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### 2.2. Label elements

#### Labelling according to Regulation (EC) No. 1272/2008 [CLP]

Hazard pictograms (CLP) :



Signal word (CLP) :

Danger

Hazard statements (CLP) :

H225 - Highly flammable liquid and vapour  
H319 - Causes serious eye irritation  
H332 - Harmful if inhaled  
H335 - May cause respiratory irritation

Precautionary statements (CLP) :

P210 - Keep away from heat/sparks/open flames/hot surfaces. - No smoking  
P240 - Ground/bond container and receiving equipment.  
P305+P351+P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing  
P403+233 - Store in a well-ventilated place. Keep container tightly closed.

### 2.3. Other hazards

No additional information available

## SECTION 3: Composition/information on ingredients

### 3.1. Substances

| Name         | Product identifier   | %   |
|--------------|--|-----|
| tert-Butanol | (CAS-No.) 75-65-0<br>(EC-No.) 200-889-7<br>(EC Index-No.) 603-005-00-1 | 100 |

Full text of H-statements: see section 16

### 3.2. Mixtures

Not applicable

## SECTION 4: First aid measures

### 4.1. Description of first aid measures

First-aid measures general

: Check the vital functions. Unconscious: maintain adequate airway and respiration. Respiratory arrest: artificial respiration or oxygen. Cardiac arrest: perform resuscitation. Victim conscious with laboured breathing: half-seated. Victim in shock: on his back with legs slightly raised. Vomiting: prevent asphyxia/aspiration pneumonia. Prevent cooling by covering the victim (no warming up). Keep watching the victim. Give psychological aid. Keep the victim calm, avoid physical strain. Depending on the victim's condition: doctor/hospital. Never give alcohol to drink.

First-aid measures after inhalation

: Remove the victim into fresh air. Respiratory problems: consult a doctor/medical service.

First-aid measures after skin contact

: Rinse with water. Soap may be used. Do not apply (chemical) neutralizing agents. Take victim to a doctor if irritation persists.

First-aid measures after eye contact

: Rinse immediately with plenty of water. Do not apply neutralizing agents. Take victim to an ophthalmologist if irritation persists.

First-aid measures after ingestion

: Rinse mouth with water. Immediately after ingestion: give lots of water to drink. Do not induce vomiting. Call Poison Information Centre ([www.big.be/antigif.htm](http://www.big.be/antigif.htm)). Consult a doctor/medical service if you feel unwell. Ingestion of large quantities: immediately to hospital.

### 4.2. Most important symptoms and effects, both acute and delayed

Symptoms/effects after inhalation

: Irritation of the respiratory tract. Irritation of the nasal mucous membranes. EXPOSURE TO HIGH CONCENTRATIONS: Central nervous system depression. Headache. Nausea. Dizziness. Mental confusion. Drunkenness. Narcosis. Disturbances of consciousness. Respiratory difficulties.

Symptoms/effects after skin contact

: Slight irritation. Red skin. Swelling of the skin.

Symptoms/effects after eye contact

: Redness of the eye tissue. Irritation of the eye tissue.

Symptoms/effects after ingestion

: AFTER ABSORPTION OF HIGH QUANTITIES: Risk of aspiration pneumonia. Vomiting. Abdominal pain. Symptoms similar to those listed under inhalation.

Chronic symptoms

: ON CONTINUOUS/REPEATED EXPOSURE/CONTACT: Dry skin. Skin rash/inflammation. Affection of the renal tissue.

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### 4.3. Indication of any immediate medical attention and special treatment needed

No additional information available

## SECTION 5: Fire-fighting measures

### 5.1. Extinguishing media

Suitable extinguishing media : Preferably: alcohol resistant foam. Water spray. Polyvalent foam. BC powder. Carbon dioxide.  
Unsuitable extinguishing media : Solid water jet ineffective as extinguishing medium.

### 5.2. Special hazards arising from the substance or mixture

Fire hazard : DIRECT FIRE HAZARD. Highly flammable. Gas/vapour flammable with air within explosion limits. INDIRECT FIRE HAZARD. May be ignited by sparks. Gas/vapour spreads at floor level: ignition hazard. Reactions involving a fire hazard: see "Reactivity Hazard".  
Explosion hazard : DIRECT EXPLOSION HAZARD. Gas/vapour explosive with air within explosion limits. INDIRECT EXPLOSION HAZARD. may be ignited by sparks. Reactions with explosion hazards: see "Reactivity Hazard".

### 5.3. Advice for firefighters

Firefighting instructions : Cool tanks/drums with water spray/remove them into safety. Do not move the load if exposed to heat.  
Protection during firefighting : Heat/fire exposure: compressed air/oxygen apparatus.

## SECTION 6: Accidental release measures

### 6.1. Personal precautions, protective equipment and emergency procedures

#### 6.1.1. For non-emergency personnel

Protective equipment : Gloves. Protective goggles. Protective clothing. Large spills/in enclosed spaces: compressed air apparatus. See "Material-Handling" to select protective clothing.  
Emergency procedures : Keep upwind. Mark the danger area. Consider evacuation. Seal off low-lying areas. Close doors and windows of adjacent premises. Stop engines and no smoking. No naked flames or sparks. Spark- and explosionproof appliances and lighting equipment. Keep containers closed. Wash contaminated clothes.

#### 6.1.2. For emergency responders

No additional information available

### 6.2. Environmental precautions

Prevent spreading in sewers.

### 6.3. Methods and material for containment and cleaning up

For containment : Contain released substance, pump into suitable containers. Consult "Material-handling" to select material of containers. Plug the leak, cut off the supply. Dam up the solid spill. Try to reduce evaporation. Measure the concentration of the explosive gas-air mixture. Dilute/disperse combustible gas/vapour with water curtain. Do not use compressed air for pumping over spills.  
Methods for cleaning up : Take up liquid spill into absorbent material, e.g.: sand, earth, vermiculite or kieselguhr, powdered limestone. Scoop absorbed substance into closing containers. See "Material-handling" for suitable container materials. Carefully collect the spill/leftovers. Damaged/cooled tanks must be emptied. Do not use compressed air for pumping over spills. Clean contaminated surfaces with an excess of water. Take collected spill to manufacturer/competent authority. Wash clothing and equipment after handling.

### 6.4. Reference to other sections

No additional information available

## SECTION 7: Handling and storage

### 7.1. Precautions for safe handling

Precautions for safe handling : Comply with the legal requirements. Remove contaminated clothing immediately. Clean contaminated clothing. Handle uncleaned empty containers as full ones. Thoroughly clean/dry the installation before use. Do not discharge the waste into the drain. Do not use compressed air for pumping over. Use spark-/explosionproof appliances and lighting system. Keep away from naked flames/heat. Keep away from ignition sources/sparks. Observe normal hygiene standards. Keep container tightly closed. Measure the concentration in the air regularly. Work under local exhaust/ventilation.

### 7.2. Conditions for safe storage, including any incompatibilities

Heat and ignition sources : KEEP SUBSTANCE AWAY FROM: heat sources. ignition sources.  
Information on mixed storage : KEEP SUBSTANCE AWAY FROM: combustible materials. oxidizing agents. reducing agents. (strong) acids.

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|                            |   |
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| Storage area               | : Store at ambient temperature. Keep out of direct sunlight. Ventilation at floor level. Fireproof storeroom. Provide for a tub to collect spills. Unauthorized persons are not admitted. Keep only in the original container. Meet the legal requirements. |
| Special rules on packaging | : SPECIAL REQUIREMENTS: closing. clean. correctly labelled. meet the legal requirements. Secure fragile packagings in solid containers.   |
| Packaging materials        | : SUITABLE MATERIAL: stainless steel. monel steel. iron. copper. nickel. bronze. MATERIAL TO AVOID: synthetic material.   |

### 7.3. Specific end use(s)

No additional information available

## SECTION 8: Exposure controls/personal protection

### 8.1. Control parameters

| tert-Butanol (75-65-0) |  |  |
|------------------------|--|--|
| Austria                | Local name   | tert-Butanol   |
| Austria                | MAK (mg/m <sup>3</sup> )   | 62 mg/m <sup>3</sup>   |
| Austria                | MAK (ppm)  | 20 ppm   |
| Austria                | MAK Short time value (mg/m <sup>3</sup> )                                | 248 mg/m <sup>3</sup>  |
| Austria                | MAK Short time value (ppm)   | 80 ppm   |
| Austria                | Remark (AT)  | H  |
| Belgium                | Local name   | Alcool tert-butylique # tert-Butanol   |
| Belgium                | Limit value (mg/m <sup>3</sup> )   | 307 mg/m <sup>3</sup> (Alcool tert-butylique; Belgium; Time-weighted average exposure limit 8 h)   |
| Belgium                | Limit value (ppm)  | 100 ppm (Alcool tert-butylique; Belgium; Time-weighted average exposure limit 8 h)   |
| Croatia                | Local name   | 2-Metil-propan-2-ol; (Tert-butil-alkohol)  |
| Croatia                | GVI (granična vrijednost izloženosti) (mg/m <sup>3</sup> )               | 308 mg/m <sup>3</sup>  |
| Croatia                | GVI (granična vrijednost izloženosti) (ppm)                              | 100 ppm  |
| Croatia                | KGVI (kratkotrajna granična vrijednost izloženosti) (mg/m <sup>3</sup> ) | 462 mg/m <sup>3</sup>  |
| Croatia                | KGVI (kratkotrajna granična vrijednost izloženosti) (ppm)                | 150 ppm  |
| Croatia                | Naznake (HR)   | F (lako zapaljivo); Xn (Štetno)  |
| Czech Republic         | Local name   | Butanol (všechny isomery)  |
| Czech Republic         | Expoziční limity (PEL) (mg/m <sup>3</sup> )                              | 300 mg/m <sup>3</sup>  |
| Czech Republic         | Expoziční limity (PEL) (ppm)   | 100 ppm  |
| Czech Republic         | Expoziční limity (NPK-P) (mg/m <sup>3</sup> )                            | 600 mg/m <sup>3</sup>  |
| Czech Republic         | Expoziční limity (NPK-P) (ppm)   | 200 ppm  |
| Czech Republic         | Remark (CZ)  | D  |
| Denmark                | Local name   | tert-Butylalkohol  |
| Denmark                | Grænseværdie (langvarig) (mg/m <sup>3</sup> )                            | 150 mg/m <sup>3</sup>  |
| Denmark                | Grænseværdie (langvarig) (ppm)   | 50 ppm   |
| Denmark                | Anmærkninger (DK)  | L (markerer, at grænseværdien er en loftværdi, som ikke på noget tidspunkt må overskrides); H (betyder, at stoffet kan optages gennem huden) |
| Estonia                | Local name   | v.a n-butanol  |
| Estonia                | OEL TWA (mg/m <sup>3</sup> )   | 150 mg/m <sup>3</sup>  |
| Estonia                | OEL TWA (ppm)  | 50 ppm   |
| Estonia                | OEL STEL (mg/m <sup>3</sup> )  | 250 mg/m <sup>3</sup>  |
| Estonia                | OEL STEL (ppm)   | 75 ppm   |
| Finland                | Local name   | tert-Butanoli  |
| Finland                | HTP-arvo (8h) (mg/m <sup>3</sup> )                                       | 150 mg/m <sup>3</sup>  |
| Finland                | HTP-arvo (8h) (ppm)  | 50 ppm   |
| Finland                | HTP-arvo (15 min)  | 230 mg/m <sup>3</sup>  |

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| <b>tert-Butanol (75-65-0)</b> |   |   |
|-------------------------------|---|---|
| Finland                       | HTP-arvo (15 min) (ppm)   | 75 ppm  |
| Finland                       | Huomautus (FI)  | iho   |
| France                        | Local name  | Alcool tert-butylque  |
| France                        | VME (mg/m <sup>3</sup> )  | 300 mg/m <sup>3</sup> (Alcool tert-butylque; France; Time-weighted average exposure limit 8 h; VL: Valeur non réglementaire indicative) |
| France                        | VME (ppm)   | 100 ppm (Alcool tert-butylque; France; Time-weighted average exposure limit 8 h; VL: Valeur non réglementaire indicative)               |
| France                        | Note (FR)   | Valeurs recommandées/admises  |
| Germany                       | Local name  | 2-Methylpropanol-2  |
| Germany                       | TRGS 900 Occupational exposure limit value (mg/m <sup>3</sup> ) | 62 mg/m <sup>3</sup>  |
| Germany                       | TRGS 900 Occupational exposure limit value (ppm)                | 20 ppm  |
| Germany                       | Remark (TRGS 900)   | DFG,Y   |
| Greece                        | OEL TWA (mg/m <sup>3</sup> )                                    | 300 mg/m <sup>3</sup>   |
| Greece                        | OEL TWA (ppm)   | 100 ppm   |
| Greece                        | OEL STEL (mg/m <sup>3</sup> )                                   | 450 mg/m <sup>3</sup>   |
| Greece                        | OEL STEL (ppm)  | 150 ppm   |
| Ireland                       | Local name  | 2-Methylpropan-2-ol   |
| Ireland                       | OEL (8 hours ref) (mg/m <sup>3</sup> )                          | 300 mg/m <sup>3</sup>   |
| Ireland                       | OEL (8 hours ref) (ppm)   | 100 ppm   |
| Ireland                       | OEL (15 min ref) (mg/m <sup>3</sup> )                           | 450 mg/m <sup>3</sup>   |
| Ireland                       | OEL (15 min ref) (ppm)  | 150 ppm   |
| Lithuania                     | Local name  | 2-metil-2-propanolis (tret-butilo alkoholis)  |
| Lithuania                     | IPRV (mg/m <sup>3</sup> )                                       | 150 mg/m <sup>3</sup>   |
| Lithuania                     | IPRV (ppm)  | 50 ppm  |
| Lithuania                     | TPRV (mg/m <sup>3</sup> )                                       | 250 mg/m <sup>3</sup>   |
| Lithuania                     | TPRV (ppm)  | 75 ppm  |
| Lithuania                     | Remark (LT)   | O (medžiaga į organizmą gali prasiskverbti pro nepažeistą odą); Ū (ūmus poveikis)   |
| Poland                        | Local name  | 2-Metylopropan-2-ol (tert-butylowy alkohol)   |
| Poland                        | NDS (mg/m <sup>3</sup> )  | 300 mg/m <sup>3</sup>   |
| Poland                        | NDSch (mg/m <sup>3</sup> )                                      | 450 mg/m <sup>3</sup>   |
| Portugal                      | Local name  | terc-Butanol (Álcool terc-butílico)   |
| Portugal                      | OEL TWA (ppm)   | 100 ppm   |
| Slovakia                      | Local name  | terc-Butanol  |
| Slovakia                      | NPHV (priemerná) (mg/m <sup>3</sup> )                           | 62 mg/m <sup>3</sup>  |
| Slovakia                      | NPHV (priemerná) (ppm)  | 20 ppm  |
| Slovakia                      | OEL STEL (mg/m <sup>3</sup> )                                   | 250 mg/m <sup>3</sup>   |
| Slovakia                      | OEL STEL (ppm)  | 80 ppm  |
| Slovenia                      | Local name  | 2-metil-2-propanol (terc-butilalkohol)  |
| Slovenia                      | OEL TWA (mg/m <sup>3</sup> )                                    | 62 mg/m <sup>3</sup>  |
| Slovenia                      | OEL TWA (ppm)   | 20 ppm  |
| Slovenia                      | OEL STEL (mg/m <sup>3</sup> )                                   | 248 mg/m <sup>3</sup>   |
| Slovenia                      | OEL STEL (ppm)  | 80 ppm  |
| Spain                         | Local name  | terc-Butanol (Alcohol terc-butílico)  |
| Spain                         | VLA-ED (mg/m <sup>3</sup> )                                     | 308 mg/m <sup>3</sup>   |
| Spain                         | VLA-ED (ppm)  | 100 ppm   |

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| Spain                  | Notes                                     | s (Esta sustancia tiene prohibida total o parcialmente su comercialización y uso como fitosanitario y/o como biocida. Para una información detallada acerca de las prohibiciones consúltese: Base de datos de productos biocidas: <a href="http://www.msssi.gob.es/ciudadanos/productos.do?tip o=plaguicidas">http://www.msssi.gob.es/ciudadanos/productos.do?tip o=plaguicidas</a> Base de datos de productos fitosanitarios <a href="http://www.magrama.gob.es/agricultura/pags/fitos/regi stro/fichas/pdf/Lista_sa.pdf">http://www.magrama.gob.es/agricultura/pags/fitos/regi stro/fichas/pdf/Lista_sa.pdf</a> ). |
| Sweden                 | Local name                                | tert-Butanol   |
| Sweden                 | nivågränsvärde (NVG) (mg/m <sup>3</sup> ) | 150 mg/m <sup>3</sup>  |
| Sweden                 | nivågränsvärde (NVG) (ppm)                | 50 ppm   |
| Sweden                 | kortidsvärde (KTV) (mg/m <sup>3</sup> )   | 250 mg/m <sup>3</sup>  |
| Sweden                 | kortidsvärde (KTV) (ppm)                  | 75 ppm   |
| Sweden                 | Anmärkning (SE)                           | H (Ämnet kan lätt upptas genom huden Det föreskrivna gränsvärdet bedöms ge tillräckligt skydd endast under förutsättning att huden är skyddad mot exponering för ämnet ifråga); V (Vägledande korttidsgränsvärde ska användas som ett rekommenderat högsta värde som inte bör överskridas)   |
| United Kingdom         | Local name                                | 2-Methylpropan-2-ol  |
| United Kingdom         | WEL TWA (mg/m <sup>3</sup> )              | 308 mg/m <sup>3</sup> 2-Methylpropan-2-ol; United Kingdom; Time-weighted average exposure limit 8 h; Workplace exposure limit (EH40/2005)  |
| United Kingdom         | WEL TWA (ppm)                             | 100 ppm 2-Methylpropan-2-ol; United Kingdom; Time-weighted average exposure limit 8 h; Workplace exposure limit (EH40/2005)  |
| United Kingdom         | WEL STEL (mg/m <sup>3</sup> )             | 462 mg/m <sup>3</sup> 2-Methylpropan-2-ol; United Kingdom; Short time value; Workplace exposure limit (EH40/2005)  |
| United Kingdom         | WEL STEL (ppm)                            | 150 ppm 2-Methylpropan-2-ol; United Kingdom; Short time value; Workplace exposure limit (EH40/2005)  |
| Russian Federation     | Local name                                | 2-Метилпропан-2-ол   |
| Russian Federation     | OEL Ceiling (mg/m <sup>3</sup> )          | 10 mg/m <sup>3</sup>   |
| Russian Federation     | Remark (RU)                               | 3 класс опасности - опасное; п (пары и/или газы)   |
| Norway                 | Local name                                | 2-metyl-2-propanol   |
| Norway                 | Grenseverdier (AN) (mg/m <sup>3</sup> )   | 75 mg/m <sup>3</sup>   |
| Norway                 | Grenseverdier (AN) (ppm)                  | 25 ppm   |
| Norway                 | Merknader (NO)                            | H (Kjemikalier som kan tas opp gjennom huden); T (Takverdi er en øyeblikksverdi som angir maksimalkonsentrasjon av et kjemikalie i pustesonen som ikke skal overskrides)   |
| Switzerland            | Local name                                | tert-Butanol   |
| Switzerland            | VME (mg/m <sup>3</sup> )                  | 60 mg/m <sup>3</sup>   |
| Switzerland            | VME (ppm)                                 | 20 ppm   |
| Switzerland            | VLE (mg/m <sup>3</sup> )                  | 240 mg/m <sup>3</sup>  |
| Switzerland            | VLE (ppm)                                 | 80 ppm   |
| Switzerland            | Remark (CH)                               | SS <sub>c</sub> - ZNS, Niere <sup>KT AN</sup> - NIOSH  |
| Australia              | Local name                                | tert-Butyl alcohol   |
| Australia              | TWA (mg/m <sup>3</sup> )                  | 303 mg/m <sup>3</sup> Synonym (tert-Butanol; 2-Methylpropan-2-ol)  |
| Australia              | TWA (ppm)                                 | 100 ppm Synonym (tert-Butanol; 2-Methylpropan-2-ol)  |
| Australia              | STEL (mg/m <sup>3</sup> )                 | 455 mg/m <sup>3</sup> Synonym (tert-Butanol; 2-Methylpropan-2-ol)  |
| Australia              | STEL (ppm)                                | 150 ppm Synonym (tert-Butanol; 2-Methylpropan-2-ol)  |
| USA - ACGIH            | Local name                                | tert-Butanol   |

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| USA - ACGIH            | ACGIH TWA (ppm)                     | 100 ppm (tert-Butanol; USA; Time-weighted average exposure limit 8 h; TLV - Adopted Value) |
| USA - ACGIH            | Remark (ACGIH)                      | CNS impair   |
| USA - OSHA             | Local name                          | tert-Butyl alcohol   |
| USA - OSHA             | OSHA PEL (TWA) (mg/m <sup>3</sup> ) | 300 mg/m <sup>3</sup>  |
| USA - OSHA             | OSHA PEL (TWA) (ppm)                | 100 ppm  |

### 8.2. Exposure controls

#### Materials for protective clothing:

GIVE EXCELLENT RESISTANCE: butyl rubber, polyethylene/ethylenevinylalcohol. GIVE GOOD RESISTANCE: No data available. GIVE LESS RESISTANCE: No data available. GIVE POOR RESISTANCE: PVC, viton

#### Hand protection:

Gloves

#### Eye protection:

Safety glasses

#### Skin and body protection:

Protective clothing

#### Respiratory protection:

Wear gas mask with filter type A if conc. in air > exposure limit

## SECTION 9: Physical and chemical properties

### 9.1. Information on basic physical and chemical properties

|   |   |
|---|---|
| Physical state                                | : Liquid  |
| Appearance                                    | : Liquid.   |
| Molecular mass                                | : 74.12 g/mol   |
| Colour  | : Colourless to white.  |
| Odour   | : Strong odour. Alcohol odour. Camphor odour.   |
| Odour threshold                               | : 957 ppm<br>2900 mg/m <sup>3</sup>   |
| pH  | : 7   |
| Relative evaporation rate (butylacetate=1)    | : 1.05  |
| Relative evaporation rate (ether=1)           | : 11  |
| Melting point                                 | : 24 - 25 °C  |
| Freezing point                                | : No data available   |
| Boiling point                                 | : 81 - 83 °C (1013 hPa)   |
| Flash point                                   | : 11 °C   |
| Critical temperature                          | : 233 °C  |
| Auto-ignition temperature                     | : 478 °C  |
| Decomposition temperature                     | : No data available   |
| Flammability (solid, gas)                     | : No data available   |
| Vapour pressure                               | : 41 hPa (20 °C)  |
| Vapour pressure at 50 °C                      | : 240 hPa (50 °C)   |
| Critical pressure                             | : 39710 hPa   |
| Relative vapour density at 20 °C              | : 2.6   |
| Relative density                              | : 0.79  |
| Relative density of saturated gas/air mixture | : 1.06  |
| Density                                       | : 789 kg/m <sup>3</sup>   |
| Solubility                                    | : Soluble in water. Soluble in ethanol. Soluble in ether. Soluble in chloroform. Soluble in aromatic hydrocarbons. Soluble in aliphatic hydrocarbons.<br>Water: (20 °C, Not applicable)<br>Ethanol: Complete<br>Ether: Complete |

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|                      |  |
|----------------------|--|
| Log Pow              | : 0.35 (OECD 107: Partition Coefficient (n-octanol/water): Shake Flask Method) |
| Viscosity, kinematic | : No data available  |
| Viscosity, dynamic   | : 0.0043 Pa.s (25 °C)  |
| Explosive properties | : No data available  |
| Oxidising properties | : No data available  |
| Explosive limits     | : 2.3 - 8.0 %(V)   |

### 9.2. Other information

|                          |  |
|--------------------------|--|
| Specific conductivity    | : 27 µS/m  |
| Saturation concentration | : 122 g/m <sup>3</sup>   |
| VOC content              | : 100 %  |
| Other properties         | : Gas/vapour heavier than air at 20°C. Volatile. Substance has neutral reaction. |

## SECTION 10: Stability and reactivity

### 10.1. Reactivity

Decomposes on exposure to temperature rise: release of highly flammable gases/vapours. Upon combustion: CO and CO<sub>2</sub> are formed. Reacts violently with many compounds e.g.: with (strong) oxidizers, with (strong) reducers and with (strong) acids: (increased) risk of fire/explosion.

### 10.2. Chemical stability

Stable under normal conditions.

### 10.3. Possibility of hazardous reactions

No additional information available

### 10.4. Conditions to avoid

No additional information available

### 10.5. Incompatible materials

No additional information available

### 10.6. Hazardous decomposition products

No additional information available

## SECTION 11: Toxicological information

### 11.1. Information on toxicological effects

Acute toxicity : Inhalation: Harmful if inhaled.

| tert-Butanol (75-65-0)    |   |
|---------------------------|---|
| LD50 oral rat             | 2,733 mg/kg (Rat; Literature study)     |
| LD50 dermal rabbit        | > 2000 mg/kg (Rabbit; Literature study) |
| LC50 inhalation rat (ppm) | > 10000 ppm/4h (Rat; Literature study)  |

|                                   |   |
|-----------------------------------|---|
| Skin corrosion/irritation         | : Not classified<br>pH: 7                 |
| Serious eye damage/irritation     | : Causes serious eye irritation.<br>pH: 7 |
| Respiratory or skin sensitisation | : Not classified                          |
| Germ cell mutagenicity            | : Not classified                          |
| Carcinogenicity                   | : Not classified                          |
| Reproductive toxicity             | : Not classified                          |
| STOT-single exposure              | : May cause respiratory irritation.       |
| STOT-repeated exposure            | : Not classified                          |
| Aspiration hazard                 | : Not classified                          |

## SECTION 12: Ecological information

### 12.1. Toxicity

|                   |   |
|-------------------|---|
| Ecology - general | : Classification concerning the environment: not applicable.  |
| Ecology - air     | : Not classified as dangerous for the ozone layer (Regulation (EC) No 1005/2009). Not included in the list of fluorinated greenhouse gases (Regulation (EC) No 842/2006). TA-Luft Klasse 5.2.5. |



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Ecology - water

: Ground water pollutant. Not harmful to fishes (LC50(96h) >1000 mg/l). Slightly harmful to invertebrates (Daphnia) (EC50 (48h): 100 - 1000 mg/l). Not harmful to algae (EC50 (72h) >1000 mg/l). Inhibition of activated sludge.

| tert-Butanol (75-65-0) |   |
|------------------------|---|
| LC50 fish 2            | 6410 mg/l (LC50; 96 h; Pimephales promelas)   |
| EC50 Daphnia 1         | 933 mg/l (EC50; EU Method C.2; 48 h; Daphnia magna; Static system; Fresh water; Experimental value) |

### 12.2. Persistence and degradability

| tert-Butanol (75-65-0)          |   |
|---------------------------------|---|
| Persistence and degradability   | Not readily biodegradable in water. No (test)data on mobility of the substance available. |
| Biochemical oxygen demand (BOD) | 0 g O <sub>2</sub> /g substance   |
| Chemical oxygen demand (COD)    | 2.18 g O <sub>2</sub> /g substance  |
| ThOD                            | 2.59 g O <sub>2</sub> /g substance  |
| BOD (% of ThOD)                 | 0   |

### 12.3. Bioaccumulative potential

| tert-Butanol (75-65-0)    |  |
|---------------------------|--|
| BCF fish 1                | < 5 (BCF)  |
| BCF fish 2                | 1 (BCF)  |
| Log Pow                   | 0.35 (OECD 107: Partition Coefficient (n-octanol/water): Shake Flask Method) |
| Bioaccumulative potential | Low potential for bioaccumulation (BCF < 500).                               |

### 12.4. Mobility in soil

| tert-Butanol (75-65-0) |                  |
|------------------------|------------------|
| Surface tension        | 0.02 N/m (25 °C) |

### 12.5. Results of PBT and vPvB assessment

No additional information available

### 12.6. Other adverse effects

No additional information available

## SECTION 13: Disposal considerations

### 13.1. Waste treatment methods

Product/Packaging disposal recommendations : Remove waste in accordance with local and/or national regulations. Hazardous waste shall not be mixed together with other waste. Different types of hazardous waste shall not be mixed together if this may entail a risk of pollution or create problems for the further management of the waste. Hazardous waste shall be managed responsibly. All entities that store, transport or handle hazardous waste shall take the necessary measures to prevent risks of pollution or damage to people or animals. Recycle by distillation. Incinerate under surveillance with energy recovery. Do not discharge into drains or the environment. May be discharged to wastewater treatment installation.

Additional information : LWCA (the Netherlands): KGA category 06. Hazardous waste according to Directive 2008/98/EC.

European List of Waste (LoW) code : 07 01 04\* - other organic solvents, washing liquids and mother liquors

## SECTION 14: Transport information

In accordance with ADR / RID / IMDG / IATA / ADN

| ADR                                     | IMDG                    | IATA                    | ADN                     | RID                     |
|---|-------------------------|-------------------------|-------------------------|-------------------------|
| <b>14.1. UN number</b>                  |                         |                         |                         |                         |
| 1120                                    | 1120                    | 1120                    | 1120                    | 1120                    |
| <b>14.2. UN proper shipping name</b>    |                         |                         |                         |                         |
| BUTANOLS                                | BUTANOLS                | Butanols                | BUTANOLS                | BUTANOLS                |
| <b>Transport document description</b>   |                         |                         |                         |                         |
| UN 1120 BUTANOLS, 3, II, (D/E)          | UN 1120 BUTANOLS, 3, II | UN 1120 Butanols, 3, II | UN 1120 BUTANOLS, 3, II | UN 1120 BUTANOLS, 3, II |
| <b>14.3. Transport hazard class(es)</b> |                         |                         |                         |                         |
| 3                                       | 3                       | 3                       | 3                       | 3                       |

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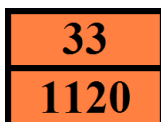


| ADR                                    | IMDG  | IATA                               | ADN                                | RID                                |
|--|---|------------------------------------|------------------------------------|------------------------------------|
|  |   |                                    |                                    |                                    |
| <b>14.4. Packing group</b>             |   |                                    |                                    |                                    |
| II                                     | II  | II                                 | II                                 | II                                 |
| <b>14.5. Environmental hazards</b>     |   |                                    |                                    |                                    |
| Dangerous for the environment : No     | Dangerous for the environment : No<br>Marine pollutant : No | Dangerous for the environment : No | Dangerous for the environment : No | Dangerous for the environment : No |
| No supplementary information available |   |                                    |                                    |                                    |

### 14.6. Special precautions for user

#### - Overland transport

|   |                     |
|---|---------------------|
| Classification code (ADR)                                 | : F1                |
| Limited quantities (ADR)                                  | : 1I                |
| Excepted quantities (ADR)                                 | : E2                |
| Packing instructions (ADR)                                | : P001, IBC02, R001 |
| Mixed packing provisions (ADR)                            | : MP19              |
| Portable tank and bulk container instructions (ADR)       | : T4                |
| Portable tank and bulk container special provisions (ADR) | : TP1, TP29         |
| Tank code (ADR)   | : LGBF              |
| Vehicle for tank carriage                                 | : FL                |
| Transport category (ADR)                                  | : 2                 |
| Special provisions for carriage - Operation (ADR)         | : S2, S20           |
| Hazard identification number (Kemler No.)                 | : 33                |
| Orange plates   | :                   |



Tunnel restriction code (ADR) : D/E

#### - Transport by sea

|                                    |  |
|------------------------------------|--|
| Transport regulations (IMDG)       | : Subject  |
| Limited quantities (IMDG)          | : 1 L  |
| Excepted quantities (IMDG)         | : E2   |
| Packing instructions (IMDG)        | : P001   |
| IBC packing instructions (IMDG)    | : IBC02  |
| Tank instructions (IMDG)           | : T4   |
| Tank special provisions (IMDG)     | : TP1, TP29  |
| EmS-No. (Fire)                     | : F-E  |
| EmS-No. (Spillage)                 | : S-D  |
| Stowage category (IMDG)            | : B  |
| Properties and observations (IMDG) | : Colourless liquids with a disagreeable odour. Explosive limits: normal-BUTANOL 1.4% to 11.2%. secondary-BUTANOL 1.7% to 9.8%. tertiary-BUTANOL 2.4% to 8%. tertiary-BUTANOL solidifies at about 25°C. normal-BUTANOL is immiscible with water. secondary-BUTANOL is immiscible with water. tertiary-BUTANOL is miscible with water. Irritating to skin, eyes and mucous membranes. |
| MFAG-No                            | : 129  |

#### - Air transport

|  |                             |
|--|-----------------------------|
| Transport regulations (IATA)                 | : Subject to the provisions |
| PCA Excepted quantities (IATA)               | : E2                        |
| PCA Limited quantities (IATA)                | : Y341                      |
| PCA limited quantity max net quantity (IATA) | : 1L                        |

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PCA packing instructions (IATA) : 353  
PCA max net quantity (IATA) : 5L  
CAO packing instructions (IATA) : 364  
CAO max net quantity (IATA) : 60L  
Special provisions (IATA) : A3  
ERG code (IATA) : 3L

### - Inland waterway transport

Classification code (ADN) : F1  
Limited quantities (ADN) : 1 L  
Excepted quantities (ADN) : E2  
Carriage permitted (ADN) : T  
Equipment required (ADN) : PP, EX, A  
Ventilation (ADN) : VE01  
Number of blue cones/lights (ADN) : 1

### - Rail transport

Transport regulations (RID) : Subject  
Classification code (RID) : F1  
Limited quantities (RID) : 1L  
Excepted quantities (RID) : E2  
Packing instructions (RID) : P001, IBC02, R001  
Mixed packing provisions (RID) : MP19  
Portable tank and bulk container instructions (RID) : T4  
Portable tank and bulk container special provisions (RID) : TP1, TP29  
Tank codes for RID tanks (RID) : LGBF  
Transport category (RID) : 2  
Colis express (express parcels) (RID) : CE7  
Hazard identification number (RID) : 33

### 14.7. Transport in bulk according to Annex II of Marpol and the IBC Code

Not applicable

## SECTION 15: Regulatory information

### 15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

#### 15.1.1. EU-Regulations

No REACH Annex XVII restrictions  
tert-Butanol is not on the REACH Candidate List  
tert-Butanol is not on the REACH Annex XIV List

VOC content : 100 %

#### 15.1.2. National regulations

##### Germany

VwVwS Annex reference : Water hazard class (WGK) 1, low hazard to waters (Classification according to VwVwS, Annex 1 or 2; ID No. 219)  
WGK remark : Classification water polluting in compliance with Verwaltungsvorschrift wassergefährdender Stoffe (VwVwS) of 27 July 2005 (Anhang 2)  
12th Ordinance Implementing the Federal Immission Control Act - 12.BImSchV : Is not subject of the 12. BImSchV (Hazardous Incident Ordinance)

##### Netherlands

SZW-lijst van kankerverwekkende stoffen : The substance is not listed  
SZW-lijst van mutagene stoffen : The substance is not listed  
NIET-limitatieve lijst van voor de voortplanting giftige stoffen – Borstvoeding : The substance is not listed

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NIET-limitatieve lijst van voor de voortplanting giftige stoffen – Vruchtbaarheid : The substance is not listed

NIET-limitatieve lijst van voor de voortplanting giftige stoffen – Ontwikkeling : The substance is not listed

### Denmark

Class for fire hazard : Class I-1

Store unit : 1 liter

Classification remarks : F <Flam. Liq. 2>; Emergency management guidelines for the storage of flammable liquids must be followed

Recommendations Danish Regulation : Young people below the age of 18 years are not allowed to use the product  
Pregnant/breastfeeding women working with the product must not be in direct contact with the product

The requirements from the Danish Working Environment Authorities regarding work with carcinogens must be followed during use and disposal

### 15.2. Chemical safety assessment

No additional information available

## SECTION 16: Other information

Abbreviations and acronyms:

|       |   |
|-------|---|
| ADN   | European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways   |
| ADR   | European Agreement concerning the International Carriage of Dangerous Goods by Road               |
| ATE   | Acute Toxicity Estimate   |
| BCF   | Bioconcentration factor   |
| CLP   | Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008                       |
| EC50  | Median effective concentration  |
| IARC  | International Agency for Research on Cancer   |
| IATA  | International Air Transport Association   |
| IMDG  | International Maritime Dangerous Goods  |
| LC50  | Median lethal concentration   |
| LD50  | Median lethal dose  |
| PBT   | Persistent Bioaccumulative Toxic  |
| REACH | Registration, Evaluation, Authorisation and Restriction of Chemicals Regulation (EC) No 1907/2006 |
| RID   | Regulations concerning the International Carriage of Dangerous Goods by Rail                      |
| SDS   | Safety Data Sheet   |
| vPvB  | Very Persistent and Very Bioaccumulative  |

Data sources : REGULATION (EC) No 1272/2008 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006.

| Full text of H- and EUH-statements: |  |
|-------------------------------------|--|
| Acute Tox. 4 (Inhalation)           | Acute toxicity (inhal.), Category 4  |
| Eye Irrit. 2                        | Serious eye damage/eye irritation, Category 2  |
| Flam. Liq. 2                        | Flammable liquids, Category 2  |
| STOT SE 3                           | Specific target organ toxicity — Single exposure, Category 3, Respiratory tract irritation |
| H225                                | Highly flammable liquid and vapour   |
| H319                                | Causes serious eye irritation  |
| H332                                | Harmful if inhaled   |
| H335                                | May cause respiratory irritation   |

SDS ISOLAB

*This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product*