SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

Product name: TERT BUTYL ACETATE  
CAS Number: 540-88-5  
Chemical characterization: Organic Ester  
Chemical Name: Acetic Acid, tert-butyl ester  
Synonyms: Tertiary butyl Acetate; Acetic Acid, 1,1-Dimethylethyl ester; 1,1-Dimethyl acetate  

Identified uses: Solvent  
Prohibited uses: Fuel blending; Fuel additive  

Company: Lyondell Chemical Company  
LyondellBasell Tower, Suite 300  
1221 McKinney St.  
P.O. Box 2583  
Houston Texas 77252-2583  

Telephone: Customer Service 888 777-0232  
Product Safety 800 700-0946  

Emergency telephone: CHEMTREC USA 800-424-9300  
LYONDELL 800-245-4532  
E-mail address: product.safety@lyb.com

SECTION 2. HAZARDS IDENTIFICATION

GHS Classification

<table>
<thead>
<tr>
<th>Flammable liquids</th>
<th>Category 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute toxicity; Inhalation</td>
<td>Category 4</td>
</tr>
<tr>
<td>Specific target organ systemic toxicity - single exposure</td>
<td>Category 3</td>
</tr>
<tr>
<td>Acute aquatic toxicity</td>
<td>Category 3</td>
</tr>
</tbody>
</table>

GHS Classification Scale (1= severe hazard; 4= slight hazard)

Label elements

Hazard symbols:

Signal Word: Danger

Hazard Statements:

H225 Highly flammable liquid and vapor.  
H332 Harmful if inhaled.  
H335 May cause respiratory irritation.  
H336 May cause drowsiness or dizziness.  
H402 Harmful to aquatic life.
Precautionary Statements:

Prevention
P210 Keep away from heat/sparks/open flames/hot surfaces.
- No smoking.
P233 Keep container tightly closed.
P243 Take precautionary measures against static discharge.
P261 Avoid breathing dust/fume/gas/mist/vapors/spray.
P280 Wear protective gloves/protective clothing/eye protection/face protection.

Response
P370 + P378 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
P304 + P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P312 Call a POISON CENTER or doctor/physician if you feel unwell.

Storage
P403 + P235 Store in a well-ventilated place. Keep cool.
P405 Store locked up.

Other hazards
Hazards Not Otherwise Classified (HNOC)
Repeated exposure may cause skin dryness or cracking.

3. Composition/information on ingredients
Substances
Chemical nature: Substance

Ingredients

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS-No. EC-No.</th>
<th>Weight %</th>
<th>Component Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tert-Butyl acetate</td>
<td>540-88-5</td>
<td>&gt; 99.5 %</td>
<td>A</td>
</tr>
<tr>
<td>Tert-Butyl alcohol</td>
<td>75-65-0</td>
<td>&lt;0.5 %</td>
<td>C</td>
</tr>
<tr>
<td>2,4,4-Trimethyl-1-pentene</td>
<td>107-39-1</td>
<td>&lt;0.5 %</td>
<td>C</td>
</tr>
</tbody>
</table>

Key:
(A) Substance
(C) Impurity
SECTION 4. FIRST AID MEASURES

First aid procedures

General advice: Take proper precautions to ensure your own health and safety before attempting rescue and providing first aid. Consult a physician/doctor if necessary. Show this material safety data sheet to the doctor in attendance.

If inhaled: If overcome by exposure, remove victim to fresh air immediately. Give oxygen or artificial respiration as needed. Call a physician.

In case of skin contact: Remove contaminated clothing as needed. Wash skin thoroughly with mild soap and water. Flush with lukewarm water for 15 minutes. If sticky, use waterless cleaner first. Seek medical attention if ill effect or irritation develops.

In case of eye contact: Thoroughly flush the eyes with large amounts of clean low-pressure water for at least 15 minutes, occasionally lifting the upper and lower eyelids. If irritation persists, seek medical attention.

If swallowed: If large quantity swallowed, give lukewarm water (pint/ 1/2 litre) if victim completely conscious/alert. Do not induce vomiting. Risk of damage to lungs exceeds poisoning risk. Obtain emergency medical attention.

Notes to physician

Symptoms: If inhalation occurs signs and symptoms may include coughing, choking, wheezing, difficulty in breathing, chest congestion, shortness of breath and/or fever. High doses may cause CNS depression (fatigue, dizziness and possibly loss of concentration, with collapse, coma and death in cases of severe over-exposure). The onset of respiratory symptoms may be delayed for several hours after exposure.

Hazards: Can cause pulmonary edema if aspirated into lungs. Harmful: may cause lung damage if swallowed.

Treatment: Treat symptomatically. Treatment of overexposure should be directed at the control of symptoms and the clinical condition of the patient. In case of ingestion, the stomach should be emptied by gastric lavage under qualified medical supervision.
## SECTION 5. FIRE-FIGHTING MEASURES

### Flammable properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flash point</td>
<td>39 °F (4 °C)</td>
</tr>
<tr>
<td></td>
<td>at 1013.0 hPa (759.8 mm Hg)</td>
</tr>
<tr>
<td>Autoignition temperature</td>
<td>1092 °F (589 °C)</td>
</tr>
<tr>
<td></td>
<td>at 1,013 hPa (760 mm Hg)</td>
</tr>
<tr>
<td>Lower explosion limit</td>
<td>~1.26 vol%</td>
</tr>
<tr>
<td>Upper explosion limit</td>
<td>~6.88 vol%</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

### Fire fighting

#### Suitable extinguishing media

SMALL FIRE: Use dry chemicals, CO2, water spray or alcohol-resistant foam. LARGE FIRE: Use water spray, water fog or alcohol-resistant foam.

#### Unsuitable extinguishing media

Do not use solid water stream - may spread fire.

#### Further information

Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations. For safety reasons in case of fire, cans should be stored separately in closed containments. Use a water spray to cool fully closed containers.

### Protective equipment and precautions for firefighters

#### Specific hazards during fire fighting

- Releases flammable vapors below normal ambient temperatures. When mixed with air and exposed to ignition source, vapors can burn in open or explode if confined. Flammable vapors may be heavier than air and travel long distances along the ground before igniting and flashing back to vapor source. Move containers from fire area if it can be done without risk. Fight fire from maximum distance or use unmanned hose holders or monitor nozzles. Cool containers with flooding quantities of water until well after fire is out. Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank. Always stay away from tanks engulfed in fire. For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

#### Special protective equipment

Wear positive pressure self-contained breathing apparatus.
for fire-fighters (SCBA). Structural firefighter’s protective clothing will only provide limited protection.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions : Use personal protective equipment. Ensure adequate ventilation.

Environmental precautions : Prevent product from entering drains. Prevent further leakage or spillage if safe to do so. If the product contaminates rivers and lakes or drains inform respective authorities.

Methods for containment / Methods for cleaning up : Extremely flammable. Eliminate all sources of ignition. All equipment used when handling this product must be grounded. Do not touch or walk through spilled material. Stop leak if you can do it without risk. Prevent entry into waterways, sewers, basements or confined areas. A vapor suppressing foam may be used to reduce vapors. Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers. Use clean non-sparking tools to collect absorbed material. Dike large spills and place materials in salvage containers. Water spray may reduce vapor; but may not prevent ignition in closed spaces.

Additional advice : See section 8 for additional PPE information.

SECTION 7. HANDLING AND STORAGE

Handling

Advice on safe handling : Use only non-sparking tools. Extinguish all ignition sources. Carefully vent any internal pressure before removing closure. Containers must be properly grounded before beginning transfer. Handle empty containers with care; vapor/residue may be flammable. All equipment must conform to applicable electrical code. This material may attack some forms of plastics, rubbers, and coatings. Isolate, vent, drain, wash and purge systems or equipment before maintenance or repair. Check atmosphere for explosiveness and oxygen deficiencies. Wear recommended personal protective equipment. Observe precautions pertaining to confined space entry. Do not breathe vapors or spray mist.
Advice on protection against fire and explosion:
Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
Take precautionary measures against static discharge.

Storage Requirements for storage areas and containers:
Store closed drums with bung in up position.
Store only in tightly closed, properly vented containers away from heat, sparks, open flame and strong oxidizing agents.
Containers must be properly grounded before beginning transfer.
This material may attack some forms of plastics, rubbers, and coatings.
Consult supplier(s) of these materials for specific recommendations.
Steel drums are recommended for packaging.

8. Exposure controls/personal protection

Control parameters

Ingredients with workplace control parameters

Occupational Exposure Limits

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>CAS-No.</th>
<th>Type</th>
<th>Limit Value</th>
<th>Basis</th>
<th>Additional Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tert-Butyl acetate</td>
<td>540-88-5</td>
<td>TWA</td>
<td>200 ppm</td>
<td>US (ACGIH)</td>
<td>2012</td>
</tr>
<tr>
<td>Tert-Butyl acetate</td>
<td>540-88-5</td>
<td>IDLH</td>
<td>1,500 ppm</td>
<td>NIOSH</td>
<td>September 2007</td>
</tr>
</tbody>
</table>

Remarks: 10% LEL

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>CAS-No.</th>
<th>Type</th>
<th>Limit Value</th>
<th>Basis</th>
<th>Additional Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tert-Butyl acetate</td>
<td>540-88-5</td>
<td>TWA</td>
<td>200 ppm</td>
<td>US (OSHA)</td>
<td>June 23, 2006</td>
</tr>
<tr>
<td>Tert-Butyl acetate</td>
<td>540-88-5</td>
<td>TWA</td>
<td>950 mg/m3</td>
<td>US (OSHA)</td>
<td>June 23, 2006</td>
</tr>
<tr>
<td>Tert-Butyl alcohol</td>
<td>75-65-0</td>
<td>TWA</td>
<td>100 ppm</td>
<td>US (ACGIH)</td>
<td>2012</td>
</tr>
<tr>
<td>Tert-Butyl alcohol</td>
<td>75-65-0</td>
<td>IDLH</td>
<td>1,600 ppm</td>
<td>NIOSH</td>
<td>September 2007</td>
</tr>
<tr>
<td>Tert-Butyl alcohol</td>
<td>75-65-0</td>
<td>TWA</td>
<td>100 ppm</td>
<td>US (OSHA)</td>
<td>June 23, 2006</td>
</tr>
<tr>
<td>Tert-Butyl alcohol</td>
<td>75-65-0</td>
<td>TWA</td>
<td>300 mg/m3</td>
<td>US (OSHA)</td>
<td>June 23, 2006</td>
</tr>
</tbody>
</table>

Consult local authorities for acceptable exposure limits.

Exposure controls
Engineering measures
Both local exhaust and good general room ventilation must be provided not only to control exposure but also to prevent formation of flammable mixtures.

Personal protective equipment
Respiratory protection : When workers are facing concentrations above the exposure limit they must use appropriate certified respirators.
Hand protection : Wear chemical resistant gloves such as: Butyl rubber.
Eye and face protection : Use splash goggles when eye contact due to splashing or spraying liquid is possible.
Skin and body protection : Depending on the conditions of use, protective gloves, apron, boots, head and face protection should be worn. The equipment must be cleaned thoroughly after each use.
Hygiene measures : Selection of appropriate personal protective equipment should be based on an evaluation of the performance characteristics of the protective equipment relative to the task(s) to be performed, conditions present, duration of use, and the hazards and/or potential hazards that may be encountered during use. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Use good personal hygiene practices. Wash hands before eating, drinking, smoking, or using toilet facilities. Wash clothing frequently.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance
Physical state : liquid
Color : Clear, colorless.
Odor : Camphor-like odor.
Odor Threshold : 71 ppb

Safety data
Flash point : 39 °F (4 °C) at 1013.0 hPa (759.8 mm Hg)
Lower explosion limit : ~1.26 vol%
Upper explosion limit: ~6.88 vol%

Flammability (solid, gas): Not applicable

Oxidizing properties: Not considered an oxidizing agent.

Autoignition temperature:
1092 °F (589 °C)
at 1,013 hPa (760 mm Hg)

Molecular weight: 116.16 g/mol

Decomposition temperature: not determined

pH: 6 - 7

Melting point/freezing point:
-72.67 °F (-58.15 °C)
at 1,013 hPa (760 mm Hg)

Boiling point/boiling range:
208.0 °F (97.8 °C)
at 1,013 hPa (760 mm Hg)

Vapor pressure:
55.995 hPa (42.000 mm Hg)
at 68 °F (20 °C)

Density:
0.86 g/cm³
at 77 °F (25 °C)

Water solubility:
7,820 mg/l
at 73 °F (23 °C)

Partition coefficient: n-octanol/water:
log Pow: 1.64
at 71.1 °F (21.7 °C)

Viscosity, dynamic:
<1 mPa.s
at 77 °F (25 °C)

Viscosity, kinematic:
<1 mm²/s

Relative vapor density: No Data Available.

Evaporation rate:
2.8
(butyl acetate = 1)

Explosive properties: Not explosive

Remarks - Other information: Additional properties may be listed in Sections 2 and 5.

SECTION 10. STABILITY AND REACTIVITY

Reactivity: Will not occur.
Chemical stability: Stable under recommended storage conditions.

Conditions to avoid: Heat, sparks, open flame, other ignition sources, and oxidizing conditions.


Hazardous decomposition products: Under hot, acidic conditions, the decomposition products are isobutylene and acetic acid.

Thermal decomposition: Carbon oxides (CO, CO2), Water.

Hazardous reactions: Not expected to occur.

---

SECTION 11. TOXICOLOGICAL INFORMATION

Product Summary: The below given information is based on the assessment of the product including impurities.

Acute toxicity

Acute oral toxicity: Based on acute toxicity values, not classified.

: High doses may cause CNS depression (fatigue, dizziness and possibly loss of concentration, with collapse, coma and death in cases of severe over-exposure).

: LD50 Oral: 4,500 mg/kg

Acute inhalation toxicity: Classified Harmful if inhaled.

: High vapor concentrations may cause CNS stimulation (increased activity, shaking, tremors) and/or depression (fatigue, dizziness, and possibly loss of concentration, with collapse, coma and death in cases of severe over-exposure).

: LC50: 12.52 mg/l

Exposure time: 4 HOURS

Method: Calculation method

Acute dermal toxicity: Based on acute toxicity values, not classified.

: LD50 Dermal: > 2,000 mg/kg

Skin corrosion/irritation: Based on skin irritation values, not classified.
May cause slight transient skin irritation.
Repeated exposure may cause skin dryness or cracking.

Serious eye damage/eye irritation
Based on eye irritation values, not classified.
Moderate eye irritation

Respiratory or skin sensitization
Respiratory sensitization
Not classified
No study available.
Skin sensitization
Not classified
No adverse effect observed.

Chronic toxicity
Carcinogenicity
Not classified
Contains a substance that has a positive carcinogenicity study.
The weight of evidence for the carcinogenicity of this substance does not meet the criteria for classification.

Germ cell mutagenicity
Not classified
No adverse effect observed.

Reproductive toxicity
Effects on fertility /
Effects on or via lactation
Not classified
No adverse effect observed.

Effects on Development
Not classified
No adverse effect observed.

Target Organ Systemic Toxicant - Single exposure
Classified, May cause respiratory irritation., May cause drowsiness or dizziness.

Target Organs: Central nervous system, Respiratory system

Target Organ Systemic Toxicant - Repeated exposure
Based on repeated exposure toxicity values, not classified.

Aspiration hazard
Based on physico-chemical values or lack of human evidence, not classified.
12. ECOLOGICAL INFORMATION

**Ecotoxicology Assessment**

<table>
<thead>
<tr>
<th>Classification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute aquatic toxicity</td>
<td>Classified Harmful to aquatic life.</td>
</tr>
<tr>
<td>Chronic aquatic toxicity</td>
<td>Not classified, based on readily biodegradability and low acute toxicity.</td>
</tr>
</tbody>
</table>

**Toxicity to fish**

- Acute toxicity to fish is very low.

**Toxicity to daphnia and other aquatic invertebrates**

- Acute toxicity to freshwater and marine invertebrates is very low.

**Toxicity to algae**

- Can inhibit growth of aquatic algae
  - EC50: 16 mg/l
  - Exposure time: 72 HOURS
  - Species: Pseudokirchneriella subcapitata (green algae)
  - Growth inhibition
  - EC50: 64 mg/l
  - Exposure time: 96 HOURS
  - NOEC: 2.3 mg/l

**Toxicity to bacteria**

- High concentrations may be harmful to sewage treatment plant microbes
  - 1.5 mg/l
  - Species: Activated sludge
  - Respiration inhibition

**Toxicity to fish (Chronic toxicity)**

- no data available

**Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)**

- no data available

**Persistence and degradability**

- Biodegradability: 50 %
  - Inherently biodegradable.
  - (After 28 days in a ready biodegradability test)
Bioaccumulative potential

Bioaccumulation: Bioconcentration factor (BCF): 5.61
This material is not expected to bioaccumulate.

Mobility in soil

Distribution among environmental compartments: Stability in water
Hydrolyzes in water, under environmental conditions
Hydrolytic half-life 334 days (8010h) at 25C and pH7

Additional advice: Stability in soil
No data available
Low absorption to soil particulates predicted

Environmental fate and pathways: No additional information available.

Results of PBT and vPvB assessment
Not applicable.

Other adverse effects

Additional ecological information: No additional information available.

SECTION 13. DISPOSAL CONSIDERATIONS

Further information: Contaminated product, soil, water, container residues and spill cleanup materials may be hazardous wastes.
Comply with applicable federal, state, and local regulations.

SECTION 14. TRANSPORT INFORMATION

DOT
UN number: 1123
Description of the goods: BUTYL ACETATES
Class: 3
Packing group: II
Labels: 3

SECTION 15. REGULATORY INFORMATION

Tertiary butyl acetate was excluded from the Federal definition of a VOC (40 C.F.R. § 51.100(s)(5)) by the U.S. Environmental Protection Agency on November 29, 2004 (69 FR 69304). State and local definitions may vary. If identified components of this product are listed under the TSCA 12(b) Export Notification rule, they will be listed below.
SARA 302/304

Component | TPO | RQ  
---|---|---
Tert-Butyl acetate | | 5000 lbs

SARA 311/312

Fire Hazard.  
Immediate (Acute) Health Hazard.

SARA 313

This product contains the following chemicals subject to the reporting requirements of SARA Title III, Section 313 and 40 CFR 372:

<table>
<thead>
<tr>
<th>Component</th>
<th>Reporting Threshold</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tert-Butyl alcohol</td>
<td>1.0%</td>
</tr>
</tbody>
</table>

State Reporting

This material is not known to contain a chemical substance known to the State of California to cause cancer, reproductive, or developmental toxicity under California Proposition 65. However, LyondellBasell has not tested for the presence of listed chemical substances.

This product contains the following chemicals regulated by New Jersey's Worker and Community Right to Know Act:

- 540-88-5 Tert-Butyl acetate
- 75-65-0 Tert-Butyl alcohol

This product contains the following chemicals regulated by Massachusetts' Right to Know Law:

- 540-88-5 Tert-Butyl acetate
- 75-65-0 Tert-Butyl alcohol
- 107-39-1 2,4,4-Trimethyl-1-pentene

This product contains the following chemicals regulated by Pennsylvania's Right to Know Act:

- 540-88-5 Tert-Butyl acetate
- 75-65-0 Tert-Butyl alcohol
- 107-39-1 2,4,4-Trimethyl-1-pentene

Other international regulations

Global Inventory Status

The ingredients of this product are compliant with the following chemical inventory requirements or exemptions.

*Additional Explanatory Status Statements follow the table, as necessary.

<table>
<thead>
<tr>
<th>Country/Region</th>
<th>Inventory</th>
<th>Status Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>AICS</td>
<td>Compliant</td>
</tr>
<tr>
<td>Canada</td>
<td>DSL</td>
<td>Compliant</td>
</tr>
<tr>
<td>China</td>
<td>IECSC</td>
<td>Compliant</td>
</tr>
<tr>
<td>Europe</td>
<td>REACH</td>
<td>See REACH Compliance Statement</td>
</tr>
<tr>
<td>Japan</td>
<td>ENCS</td>
<td>Compliant</td>
</tr>
</tbody>
</table>
SAFETY DATA SHEET

TERT BUTYL ACETATE

Version 1.0  Revision Date 12/04/2014  Print Date 05/12/2015  SDS No.: BE2458

<table>
<thead>
<tr>
<th>Country</th>
<th>Acronym</th>
<th>Compliant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Korea</td>
<td>KECI</td>
<td>Compliant</td>
</tr>
<tr>
<td>New Zealand</td>
<td>NZIoC</td>
<td>Compliant</td>
</tr>
<tr>
<td>Philippines</td>
<td>PICCS</td>
<td>Compliant</td>
</tr>
<tr>
<td>United States of America</td>
<td>TSCA</td>
<td>Compliant</td>
</tr>
</tbody>
</table>

**REACH status**

If the product has been purchased from any company of the LyondellBasell group of companies registered in the European Union, we confirm that the chemical substance in this product has been pre-registered or, where required under REACH, registered, and that we have the intention to proceed with any required registration in accordance with the deadlines set forth in REACH. (Regulation (EU) No. 1907/2006)

Contact product.safety@lyb.com for additional global inventory information.

**SECTION 16. OTHER INFORMATION**

**Further information**

<table>
<thead>
<tr>
<th>Classification</th>
<th>Health Hazard</th>
<th>Flammability</th>
<th>Physical hazards</th>
</tr>
</thead>
<tbody>
<tr>
<td>HMIS</td>
<td>1</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>NFPA</td>
<td>1</td>
<td>3</td>
<td>0</td>
</tr>
</tbody>
</table>

**Other Information**

HMIS rating scale (0 = minimal hazard; 4 = severe hazard)
NFPA rating scale (0 = minimal hazard; 4 = severe hazard)

**Material safety datasheet sections which have been updated:**

Revised Section(s): 1 2 3 8 11 12 15  Revision Date: November 30 2014

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